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Believe me,

Most sincerely yours,

JOS. D. HOOKER.

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BY

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Late Director of the Royal Botanic Gardens of Kew.

Nature and Art to adorn the page combine,
And flowers exotic grace our northern clime.

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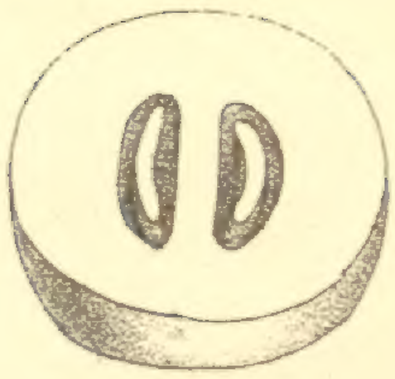

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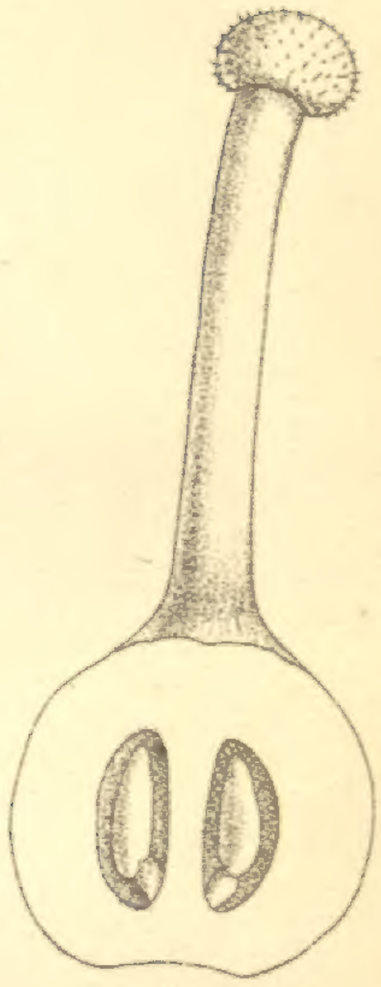

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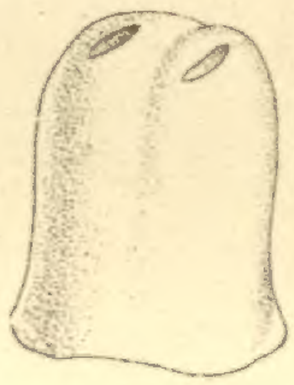

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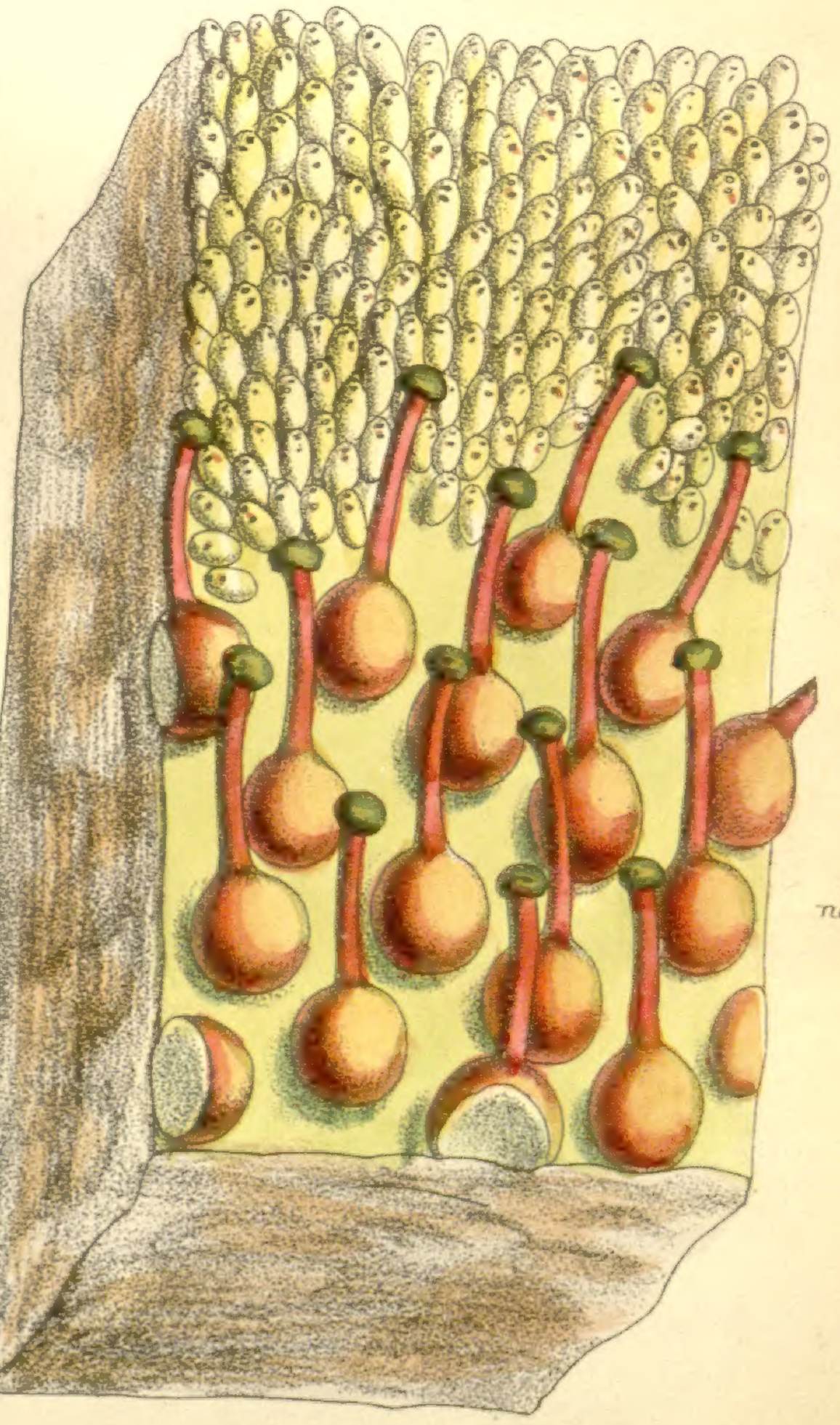

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Tab. 7153, 4, 5.

AMORPHOPHALLUS Titanum.

Native of Sumatra.

Nat. Ord. Aroideæ.—Tribe Pythonieæ.

Genus Amorphophallus, *Blume; (Benth. et Hook. f. Gen. Pl.* vol. iii. p. 971.)

Amorphophallus (Brachyspatha) *Titanum;* tubere maximo depresso-globoso, folii petiolo 16-pedali lævi albo-punctato, lamina ambitu 30–45-pedali trisecta, segmentis di-tri-sectis dichotome pinnatisectis pinnatifidisectisve ultimis ovato-oblongis caudato-acuminatis, sinubus angustissimis, supra læte viridibus nervis impressis subtus pallidioribus, pedunculo brevi crasso albo-punctato, spatha juniore cataphyllis oblongis luride viridibus albo punctatis vestita, maturæ tubo crasso infundibulari-flavo virescente in laminam late campanulatam rubro-purpuream expanso, lamina 3–4 ped. diam. ambitu recurva plicata marginibus grosse inæqualiter dentatis, spadice spatha sub duplo longiore 5-pedali crasso stricto erecto, appendice quam inflorescentia triplo longiore a basi ad apicem sensim attenuato pallide aureo-flavo lævi, inflorescentiis tubo spathæ inclusis 10 poll. diam., feminea e ovariis globosis sessilibus dissitis 2–3-locularibus in stylos duplo longiores contractis, stigmatibus globosis, loculis 1-ovulatis, ovulis basilaribus infl. masc. e antheris sessilibus confertis ellipsoideis 2-porosis, baccis ovoideis rubris 1–2-spermis, seminibus plano-convexis.

A. Titanum, *Beccari in Bull. Soc. Toscan. di Ortic.* 1879, p. 46; *Arcangeli in Nuov. Giorn. Bot. Ital.* vol. xi. (1879), p. 217; *Engler, Monog. Arac.* p. 643; *Masters in Gard. Chron.* 1886. ii. p. 432, figs. 88 and 89; 1889, i. p. 746 and 804, figs. 119 and 120; 1889, ii. 19, figs. 3, 5, 6; *Beccari in Bull. Soc. Toscan. di Ortic. Ser.* 2, vol. iv. 1889, p. 250, 266, t. viii. et *Schneider in Le Jardin.* 1889, p. 178. (*cum Ic. ex Journ. Hort.* vol. lxxxii. p. 6, f. 2, *iterat.*)

Conophallus Titanum, *Beccari in Bull. Soc. Tosc. di Ortic.* 1878, p. 271, 291; *Masters in Gard. Chron.* 1878, p. 788, fig. 127.

The earliest account of this wonderful plant that reached Europe, is contained in an article under the title "Una Pianta Maravigliosa," communicated by Signor Fenzi of Florence, to the Royal Tuscan Society of Horticulture, in September, 1878 (Bull. Soc. Toscan. di Ortic. 1878, p. 271). It consists of the contents of a letter addressed from Sumatra by the illustrious traveller and botanist, Dr. Beccari, to his friend the Marchese Corsi Salviati, in which he announces the discovery of a gigantic aroid, probably belonging to the genus *Conophallus*, and gives some details of its huge dimensions. It was shortly afterwards followed by another article under the title of

Conophallus ? Titanum in the same Journal, p. 290, and from the same sources, giving fuller details as to its fruiting condition and foliage, together with a sketch of the plant in its flowering state. Together with this information Dr. Beccari sent both tubers and seeds to the Marchese. As regards the tubers the result was unfortunate; for, according to the law of 1875, making provision against the introduction of the vine disease (*Phyllorera*), the tubers were detained at Marseilles till they rotted. The seeds, on the other hand, arrived in good condition, and germinated in the Marchese's garden, whence some very young plants were transmitted to Kew by that nobleman, at Dr. Beccari's request.

In 1878 the accounts received from Dr. Beccari were communicated by Signor Fenzi to the "Gardener's Chronicle," published in December of the same year (vol. 1878, ii. pp. 596 and 788), together with a copy of the sketch of the flowering plant.

In the following year a full botanical account of the plant was drawn up from Dr. Beccari's notes by Prof. Arcangeli, which appeared in the new Journal of the Botanical Society of Italy (vol. xi. p. 217) under the title of "L'Amorphophallus Titanum, *Beccari*, illustrato di G. Arcangeli" (*Conophallus* being regarded by botanists as a section of the latter genus). Before proceeding further with the history of this bulky vegetable I shall give Dr. Beccari's account of its discovery, extracted from his article in the Bulletin of the Royal Tuscan Society of Horticulture, vol. iv. (1889), p. 250, with a figure copied by permission of Dr. Hogg from the Journal of Horticulture.

"It was on the 6th of August, 1878, at Ajer Mantcior, in the Padang Province of Sumatra, that I found the leaves of this extraordinary plant. Shortly afterwards, being at Kajù Tanam, a place not far from Ajer Mantcior, and there informed that the *Amorphophallus* was common on the surrounding hills, I offered a large reward to any one who would bring me a flower. This promise produced a more speedy effect than I could have hoped for, for on the 5th of September, towards midday, I had the satisfaction of possessing a flower of this marvel.

"The single flower (or more correctly inflorescence) with

the tuber (from which it springs almost directly), form together so ponderous a mass, that for the purpose of transporting it, it had to be lashed to a long pole, the ends of which were placed on the shoulders of two men. To give an idea of the size of this gigantic flower, it is enough to say that a man standing upright can barely reach the top of the spadix with his hand, which occupies the centre of the flower, and that with open arms he can scarcely reach half way round the circumference of the funnel-shaped spathe from the bottom of which the spadix arises."

Signor Beccari then proceeds to describe the flowering, &c., of the *Amorphophallus* at Kew, but as Mr. Watson, to whom the honour of growing and flowering the plant is due, has been so good as to furnish me with a more detailed account of the same, I pass over that part of the narrative, and proceed to Signor Beccari's description of the fruiting plant. "The spadix in this condition is another wonder of the vegetable kingdom. It forms a cylindric column more than three feet three inches in height and six inches in diameter, green marbled with white, and bearing in its upper part (the male and sterile part (appendage). having decayed and fallen away), a mass of berries pressed together, the whole forming a stout cylindric body, nearly two feet long. But for its size the fruiting spadix resembles that of *Arum italicum*. Each fruit is as large as a small cherry, rather elongate, smooth and carmine red in colour; it encloses one to three seeds, each enveloped in a copious pulp."

The Sumatran name of this *Amorphophallus* is Grubi, Krubi, and Krubut, names which the natives give to other aroids. The tubers are said to be edible, but it is not known how they are prepared for food. With regard to its conditions of growth, the position of Ajer Manteior, on the west coast of Sumatra, is 364 metr. (1183 feet), and of Kajù Tanam, 135 metr. (440 feet) above the sea; the atmosphere is perennially humid; the mean highest and lowest temperatures at the former locality are 25° and 32° cent. (77°—89° Fahrt.) in the shade, rarely falling to 22° and rising to 35° (71° and 95° Fahrt.). The plant courts a deep shade, and a light soil.

Unimpeachable as is Dr. Beccari's character for scientific

accuracy, it is satisfactory to have had, before it flowered and leafed at Kew, a full confirmation of his account of the dimensions of a plant so marvellously exceeding all others of its kind; and this is supplied by the naturalist and traveller, Forbes, who is the only other European known to have seen this plant in its native state. He says, in his "Naturalist's Wanderings in the Eastern Archipelago," at page 175, that he found the *Amorphophallus* in the Barisan range, growing in a sandy soil, the biggest specimen measuring seventeen feet in height; and again at page 227, when on the Kling river he met with the largest tubers ever yet recorded, being six feet six inches in circumference, and the stem (presumably the petiole) at the base, two feet seven inches in circumference, the whole being a load for twelve men.

Shortly after Signor Beccari's return to Italy from the East, the Marchese Corsi Salviati caused a full-sized drawing of this giant to be made under Dr. Beccari's supervision, and of this he presented (in 1881) a copy to Kew, where it forms a most striking feature in the ceiling of the fine hall devoted to the collection of timbers, &c., and is certainly the most surprising of the many wonders of the vegetable kingdom that are there displayed. The dimensions of the picture (which has no margin) are eighteen feet by fifteen feet six inches, it represents a leaf of the full size, growing out of the ground, and underneath it two Sumatrans carrying a flowering specimen lashed to a pole.

Before proceeding to give Mr. Watson's account of the treatment and flowering of this plant at Kew, it is not out of place to consider its position amongst the recognized wonders of the vegetable kingdom. These may be for convenience divided into the Morphological and Physiological; under the first of which the Titan comes, and under a subdivision characterized by bulk, and the attainment of this in respect of all the organs (except perhaps the root, as regard time, and the pollen, and ovules as regards dimensions) in a marvellously short time. In structure it differs only specifically from a dozen other *Amorphophalli*, many of which are very big, and grow as fast, but they do not attain so portentous a bulk, and none

exceeds the others in this respect so vastly. For comparison Professor Arcangeli has given the size of the largest congener hitherto discovered, curiously enough a native of the same island, namely *A. Gigas*, Teysm. and Binnend, the length of the petiole and peduncle of which is six and a half feet, and of the spadix three feet three inches. It differs from *Titanum* in the long peduncle, and in having a broad, open spathe. Along with which should be mentioned (as is in the *Gardener's Chronicle*, 1878, p. 788), the allied Nicaraguan gigantic aroid *Godwinia Gigas*(Tab. 6048) of this work, of which the tuber attains two feet two inches in circumference and a weight of over seven pounds, the petiole a height of ten feet, and the leaf ten feet in circumference, the peduncle four feet in length, and spathe one foot eight inches. There are also gigantic aroids of which little is known in tropical Africa, but there is no reason to suppose that they rival the Asiatic *Amorphophalli*. In one point alone our Titan surpasses all other plants, and that is in the rapid development of tissue in a single leaf. I can think of none in which so great an amount is produced and brought to maturity in so short a time. The largest leaved plants occur amongst the Palms, and next to them come the Musas ; their leaves in many instances far surpass in dimensions and weight those of Titan, but they are not formed so rapidly, and are comparatively slow of maturation.

Lastly, the flower of *Rafflesia Arnoldi*, a native of Sumatra, well known for its gigantic size, has been alluded to as dwarfed in comparison with that of this *Amorphophallus*, but a single hermaphrodite flower of *Rafflesia* is far more remarkable as a flower than is the inflorescence of this aroid as such, and the two are not in any way further comparable than that each is gigantic.

The following account of the development and flowering of *A. Titanum* at Kew has been kindly drawn up for me by Mr. Watson, Assistant Curator of the Royal Gardens, who reared it from infancy to its full stature. Unfortunately the flowering stage was so rapid that it was witnessed by few, and by them at the expense of enduring an atrocious stench, resembling that of *Bulbophyllum Beccarii* (Tab. 6567), which rendered the tropical Orchid house at

Kew unendurable during its flowering in 1881. I should be wanting in gratitude if I did not here express my deep obligation to the talented artist of this work (Miss Smith), who, in her efforts to do justice by her pencil to these plants, suffered in each case a prolonged martyrdom that terminated in illness in the case of the orchid.

"The plant of *Amorphophallus Titanum*, which flowered at Kew in June, 1889, was received by Sir Joseph Hooker from Dr. O. Beccari, through the Marchese Corsi Salviati, of Sesto, near Florence, exactly ten years previously (June, 1879). It was then a small seedling, which had been raised in the Botanical Gardens at Florence from seeds forwarded by Dr. Beccari soon after he discovered the plant in Sumatra in 1877.

"The plant at Kew was grown in a stove along with other tropical tuberous aroids until it became too large for the house, when it was removed to the house where the Victoria regia is grown. Here it was placed on an inverted pot in the tank, the water in which in summer was heated to about 80° Fahr. Although deciduous, like the other *Amorphophalli*, yet *A. Titanum* sometimes retained its leaf fully twelve months, or even more. On the leaf decaying the tuber was taken out of the soil, washed, and buried in clean moist silver sand, and kept in a temperature of about 70°. It was repotted in rich loamy soil as soon as it began to push into fresh growth.

"In the spring of 1887 the tuber was three feet nine inches in circumference and ten inches deep. The new leaf pushed through the soil in the first week in June, and grew so rapidly that in about six weeks it was mature. The dimensions of the plant at that time were as follows:— Along with them are the dimensions of wild examples as measured by Dr. Beccari" (to which I have added the measurements by Forbes.—*J. D. H.*) :—

	Circumference of tuber.	Height of petiole.	Circumference of petiole at base.	Circumference of petiole at apex.	Circumference of leaf-blade.
	ft. in.	ft. in.	ft. in.	ft. in.	ft.
Kew plant, 1887 .	3 9	6 6	1 10	1 1	26
Native plants (Beccari) . . .	5 0	10 0	3 0	...	45
Forbes . . .	6 6	17 0	2 7	...	...

"In 1888 the leaf was even larger, the spread of the blade being twelve feet, the stalk eight feet high and nine inches in diameter at the base.

"The tuber was weighed in March, 1889, before being repotted, it was fifty-seven pounds in weight, and measured eighteen inches in diameter, by twelve inches in depth. In the early stages of growth there was no perceptible difference between the development of the flower-bud and a leaf-bud, both being enclosed in a large sheath which withers and falls off early. By June 5th, however, the top of the spathe pushed through the sheath; after which the inflorescence grew in height about three inches per day, and reached its full development on June 21st. Its ultimate height was six feet nine inches. The peduncle was eighteen inches high, the spathe three feet long and four feet across the mouth, and the spadix five feet long by ten inches in diameter at the thickest part above the flowers.

"The spathe began to unfold at five p.m., was fully expanded by half-past six; and at eight p.m. it had begun to close again, and by eleven o'clock it had entirely closed. The stench emitted by the flowers was very powerful, and suggested a mixture of rotten fish and burnt sugar. Many blue-bottle flies were attracted by it. The smell had ceased within forty-eight hours after the spathe unfolded. By fixing a wire crinoline inside the spathe it was made to keep something like its natural appearance until it began to wither.

"All the roots died after the flower was over, and on again weighing the tuber it was found to have lost nine pounds in weight as a result of the production of the huge inflorescence.

"At the present time (November, 1890), the plant is in full leaf, and although not quite so large as it was previous to flowering, it is perfectly sound and promising. The present leaf is nearly thirteen months old."

It remains to indicate the position of *A. Titanum* in the genus *Amorphophallus*, which contains about fifteen well defined species, all tropical Asiatic and Malayan. Of these, one, the common Indian *A. campanulatus*, is supposed to extend to New Guinea and the Fiji Islands, and to occur also in Madagascar; but as it is not possible to identify such plants without living specimens or good

drawings, of which there are none of this species from the islands above mentioned, it is not safe to infer that it has so exceptional a distribution. It is the type of the genus, and of the first section, *Candarum*, distinguished by its short peduncle, very broad open campanulate spathe, short thick appendix of the spadix, and globose ovaries with long styles. (See t. 2812 and t. 5187 of this Magazine.) In the second section *Brachyspatha* the peduncle is elongated, the spathe short, the appendage of the spadix very long, acute, and the style short. To this section belongs the *A.* (*Proteiophallus*) *Riveri* of this Magazine (t. 6295). The third section *Conophallus* has a long or short peduncle, a spathe with a convolute tube gradually contracted into a concave limb, a thick conical appendix, and sessile stigma. To it belongs *A. bulbifer* (*Arum bulbiferum*, t. 2072 and t. 2508). From these definitions it will be seen that *A. Titanum* does not agree with any, but that it comes nearest to *Brachyspatha*, in which Engler has placed it, and I think rightly, provided the sectional character be slightly modified by disregarding the length of the style and form of the appendages of the spadix.—*J. D. H.*

Plate 7153. Flowering plant of *Amorphophallus Titanum* about one-eighth of the natural size.

Plate 7154. Leaf and petiole of the same one-tenth of the natural size, and portion of the apex of a segment of the natural size.

Plate 7155. Young inflorescence of the same the day before expansion, one-ninth of the natural size. Fig. 1, Portion of spadix with male and female flowers of the natural size; figs. 2 and 3, stamens; fig. 4, longitudinal, and 5, transverse section of an ovary; figs. 6 and 7, ovules :—*figs.* 2–7 *enlarged.*

Tab. 7156.

DIPLADENIA illustris. *Var.* glabra.

Native of Brazil.

Nat. Ord. Apocynaceæ.—Tribe Echitideæ.

Genus Dipladenia, *Alph. DC.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 726.)

Dipladenia (Eudipladenia) *illustris*; glabra pubescens v. velutino-pubescens, foliis exstipulatis breviter petiolatis oblongis rotundatisve obtusis v. subacutis coriaceis basi rotundatis v. subcordatis multinerviis, racemis terminalibus 4–8-floris, bracteis subulato-lanceolatis pedicellis multoties brevioribus, sepalis subulatis, corollæ tubo ad medium anguste cylindraceo dein infundibulari, limbo 3–3½ poll. diam. rosei lobis orbiculari-ovatis obtusis, filamentis brevissimis tomentosis, stigmate conoideo 5-costato basi intruso 5-lobo.

D. illustris, *Alph. DC. in Prodr.* vol. viii. p. 483; *Muell. Arg. in Mart. Fl. Bras.* vol. vi. pt. 1, p. 125.

D. Gardneriana, *Alph. DC. l. c.*

D. Rosa campestris, *Lem. in Fl. des Serres.* t. 256.

Echites illustris, *Vellozo Flor. Flum.* vol. iii. t. 49; *text*, p. 114.

E. venenosa, *Mart. Ex. Stadelm. in Flora*, 1841, *Beibl.* p. 66; *Alph. DC. l. c.* 470.

Var. *glabra*; tota glabra.

D. illustris, var. *glabra*, *Muell. Arg. l. c.* t. xxxviii.

D. Alexicaca, *Alph. D.C. l. c.* p. 484. *Mart. Ex.*

D. androsæmifolia, *Alph. DC. l. c.* p. 484.

Echites Alexicaca, *Mart. Ex. Stadelm. l. c.* p. 68.

Of the species of *Dipladenia* figured in this Magazine, *D. illustris* is very closely allied to two, namely, *D. acuminata*, t. 4828, which has large branched stipular processes, very much larger flowers with narrower more acute corolla-lobes and a more cylindric upper half of the tube, and *D. splendens* (*Echites splendens*, t. 3976), which has a shorter corolla-tube, and acuminate leaves, cordate at the base. Both these differ further from *D. illustris* in their membraneous leaves with distant arching nerves. Of the few other plants figured in this work under *Dipladenia*, two do not belong to the genus, namely *D. Harrisii*, t. 4825, which is an *Odontadenia*, having amongst other differential characters a cupular erect disk surrounding the ovary, and a very different calyx and stigma, and

D. flava, t. 4702, a species of *Urechites*, which is distinguished by the long twisted tips of the anther, and the stigma of *Odontadenia* and *Echites*.

D. illustris is a native of Brazil, where it has a very wide range, from the province of Bahia in the north to that of St. Paul in the south. Specimens are in the Kew Herbarium, collected in Central Brazil by M. Glaziou, Director of Public Parks, &c. It is an exceedingly variable plant as to foliage, and Mueller has devoted a page to its diversity of form and clothing, from oblong to orbicular and from perfectly glabrous, as in the form here figured, to softly tomentose or almost woolly. *D. Gardneriana* is a form with sparingly pubescent oblong leaves, but not otherwise distinguishable. *D. illustris* is likely to be confounded with another Brazilian coriaceous leaved species, *D. gentianoides*, in which the lower cylindric portion of the calyx is only one-fourth or one-third as long as the upper, which is more inflated and subcylindric. The fruit of *D. illustris* consists of two long perfectly straight acuminate follicles, eight to ten inches long, not so thick as a goose-quill. The plant has been described as poisonous to cattle.

The specimen figured was sent by Messrs. Sander, of St. Albans, in July of this year.—*J. D. H.*

Fig. 1, Calyx, tube of corolla and stamens; 2 and 3, stamens; 4, pistil:—*all enlarged.*

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Tab. 7157.

MAGNOLIA Watsoni.

Native of Japan.

Nat. Ord. Magnoliaceæ.—Tribe Magnolieæ.

Genus Magnolia, *Linn.*; (*Benth. and Hook. f. Gen. Pl.* vol. i. p. 18.)

Magnolia *Watsoni*; glaberrima, foliis breviuscule petiolatis oblongis obovatisve subacutis v. cuspidatis undulatis basi cuneatis v. roduntatis supra saturate viridibus luteo marginatis subtus pallidis junioribus sericeis, nervis utrinque 10–15 arcuatis impressis costaque flavidis, floribus odoratis foliis coetaneis 5–6 poll. diam., sepalis oblongis v. lineari-oblongis concavis demum reflexis roseis v. pallide purpureis, petalis late obovatis concavis obtusis patentibus albidis, staminibus numerosissimis multiseriatis recurvis, filamentis sanguineis antheras lineares obtusas sordide carneas æquantibus, gynostegio oblongo crasse stipitato, carpellis lanceolatis acuminatis erectis lente recurvis, stigmatibus linearibus.

It is with considerable hesitation that I propose the subject of this plate as a new species of *Magnolia*, considering how imperfectly described are the Chinese and Japanese members of this genus. That it is not *M. parviflora* is obvious, as the size of the flowers implies. Of this latter I have seen a good dried specimen, and an excellent figure by Keisuke Ito ("Figures and Descriptions of Plants in the Koishikawa Botanical Gardens (Tokio)" by Keisuke Ito, Professor of Botany in the University of Tokio, vol. i. t. 13), and these perfectly agree with the description published by Siebold and Zuccarini, who ascribe to it small orbicular-obovate cuspidate membranous deciduous leaves with few nerves (6-8 pairs), and small flowers with long slender pedicels. *M. Watsoni* is much nearer *M. hypoleuca* Sieb. and Zucc. (Keisuke Ito, t. 14) which is a larger plant with robust branches, large oblong leaves densely pruinose and thinly hairy beneath, and more or less biennial in duration. I have the pleasure of naming it after Mr. W. Watson, the Assistant-Curator of the Royal Gardens, to whose skill and care the Botanical Magazine is indebted for the flowering of so many of the interesting plants depicted in its plates.

February 1st, 1891.

M. Watsoni was purchased for the Royal Gardens from the Japanese Court of the Paris Exhibition in 1889, and flowered in the open ground at Kew in June of last year. The flowers had a powerful odour of *Calycanthus*.

Descr. A small tree, flowering and leafing at the same time; branchlets smooth, terete, annulate. *Leaves* four to seven inches long by two to three and a half broad, elliptic- or obovate-oblong or orbicular-obovate, obtuse or cuspidate, somewhat waved, deep green above with yellow margins and nerves, paler beneath and when young clothed with fine silky appressed hairs, base rounded or cuneate; nerves ten to fifteen pairs, arched, deeply impressed above; petiole one half to one inch long. *Flowers* solitary, terminal, very shortly peduncled, five to six inches in diameter. *Sepals* oblong or linear-oblong, subacute or obtuse, very concave, rose-coloured or pale-purplish on the back, at length deflexed. *Petals* broadly obovate, obtuse, unequal, very concave, spreading, cream-coloured. *Stamens* very numerous, in many series, recurved, forming a broad ring round and incumbent on the petals, about one-third of the latter in length; filaments blood-red, as long as the linear, dirty reddish-yellow anthers. *Pistil* an oblong mass of closely imbricating lanceolate carpels narrowed into slightly recurved styles, and terminating a very stout columnar stipes; stigmas linear, decurrent on the inner face of the style.—*J. D. H.*

Figs. 1 and 2, front and back view of stamens; 3, style of carpel:—*both enlarged.*

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Tab. 7158.

CATASETUM FIMBRIATUM.

Native of Brazil.

Nat Ord. Orchideæ.—Tribe Vandeæ.

Genus Catasetum, *L. C. Rich.*; (*Benth. et. Hook. f. Gen. Plant*, vol. iii. p. 551.)

Catasetum *fimbriatum*; foliis 10–12-pollicaribus lanceolatis acuminatis, racemo pendulo multifloro, bracteis lanceolatis, pedicellis 1–1½ pollicaribus, sepalis albis roseo creberrime fasciolatis, dorsali erecto lineari acuminato concavo, lateralibus sub labio deflexis lanceolatis acuminatis marginibus revolutis, petalis oblanceolatis sepalis æquilongis et concoloribus, labello amplo lato flabelliformi margine anteriore recurvo pectinatim fimbriato, disco antice in processum dentiformem producto medio concavo sacculum calcariforme latum conicum obtusum formante albo lateribus prope basin utrinque rubro fasciolatis, columna alba rubro-punctata in rostrum acuminatum producta, cirrhis breviusculis deflexis.

C. fimbriatum, *Lindl. in Paxt. Fl. Gard.* vol. i. p. 124. *cum Ic. Xyl.* 84; *Walp. Ann.* vol. vi. p. 569; *Rolfe in Gard. Chron.* 1889, ii. p. 406.

Myanthus fimbriatus, *Morren in Ann. de Gand.*, vol. iv. (1848), p. 453, t. 232.

C. fimbriatum has been long in cultivation on the Continent and in this country. It was exhibited (and won a gold medal it is said) at the Brussels National Horticultural Exhibition of 1848, by Madame Legrelle, who introduced it from Brazil, and it was shortly afterwards figured in the Annales de Gand, and in Paxton's Magazine. According to the Belgian reports it excited extraordinary attention "pendant trois jours plus de 100,000 yeux se fixèrent sur cette étrange et admirable gynandre, dont le parfum embaumait la salle." Upon which Lindley sententiously remarks, "In this country people would hardly have remarked it."

Reichenbach has described (Gard. Chron. 1881, pt. 1, p. 498) a variety of it (var. *fissum*), grown by Makoy, of Liege, as having a deeper divided lip, and toothed petals spotted with purple on a light ground. This variety has recently been figured in the Revue de l'Hort. Belge (vol. xiv. 1888, p. 273), and described by Count O. de Kerchove; but except in the dark red brown scape and rachis of the

panicle there is little difference between this variety and that here figured. Other varieties are described as having rose-red flowers; and one, var. *viridulum*, Reichb. f. (in Gard. Chron. 1887, ii. 272), as having green flowers spotted with reddish-purple. The specimen here figured was obtained from Messrs. F. Sander & Co., of St. Albans, in the spring of 1889, and flowered in the Royal Gardens in October of last year. It was received as var. *platypterum*, Reichb. f. (in Gard. Chron. 1889, i. 168), which is described as having a garlic green lip.

Descr. *Pseudobulbs* two to three inches long, sheathed. *Leaves* many, subsessile, eight to twelve inches long by three to four broad, oblong-lanceolate, acuminate, seven- to nine-nerved. *Raceme* pendulous, eight- to nine-fld.; peduncle terete, green, about as long as the inflorescence; flowers about an inch apart; bracts lanceolate, half an inch long, appressed to the pedicel, which with the ovary is one and a half inch long. *Flowers* two and a half inches long from the tip of the dorsal to those of the lateral sepals; sepals white or pale yellowish, closely barred with red; dorsal erect, slightly incurved, linear-lanceolate, acuminate, concave, channelled down the back; lateral, deflexed under the lip, lanceolate, acuminate, margins broadly revolute. *Petals* as long as and conniving with the dorsal sepal, oblanceolate, acuminate, coloured like the sepals. *Lip* very large, cowslip yellow, very broadly flabellate, retuse, the margin in front deeply laciniate, the sides towards the base revolute, and faintly barred with red, the disk excavated and forming an obtuse conical sac or spur; between the mouth of the sac and retuse apex of the lip is a thickened triangular obtuse callus. *Column* large, ending in a long beak, pale yellowish, speckled with red; bristles slender, deflexed and incurved. *Anther* large, elongate, conical; pollen-masses large, oblong; strap broad, with inflexed margins, disc at base rounded. —*J. D. H.*

Fig. 1, Column; 2, anther; 3, pollen :—*all enlarged.*

J S del, J.N. Fitch lith

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Tab. 7159.

RHODODENDRON SCABRIFOLIUM.

Native of Western China.

Nat. Ord. Ericaceæ.—Tribe Rhodoreæ.

Genus Rhododendron, *Linn.*; (*Benth. and Hook. f. Gen. Pl.* vol. ii. p. 599.)

Rhododendron *scabrifolium*; ramulis robustis strictis hispido-setosis, foliis breviter petiolatis lanceolatis v. oblongo-lanceolatis utrinque acutis coriaceis marginibus subrecurvis supra scabrido-pubescentibus suturate viridibus subtus dense lepidotis nervis validis arcuatis hispidulis, floribus in cymas terminales dispositis longiuscule pedicellatis, pedicellis hispidulis basi bracteis imbricatis scariosis oblongis velatis, calycis parvi hispidi et lepidoti lobis parvis ovatis acutis, corollæ late campanulatæ tubo brevi, lobis 5 oblongis obtusis patentibus, staminibus 10 filamentis glaberrimis corollæ lobis æquilongis, ovario ovoideo tereti hispido et lepidoto 5-loculari, stylo gracili basi piloso, stigmate capitato crenato.

R. scabrifolium, *Franchet in Bull. Soc. Bot. France*, vol. xxxiii. p. 236; *Forbes & Hemsl. in Journ. Linn. Soc. Bot.* vol. xxvi. p. 30.

This is one of the numerous recently discovered Rhododendrons of Western China, to which allusion was made when describing *R. Boothii* (t. 7149). It formed one of a collection of thirty-six Chinese species (all but two of them previously unknown) sent to Paris by the Abbé Delavay, chiefly from the mountains of Yun-nan. They are described by M. Franchet, in the Bulletin of the Botanical Society of France, and all referred to one section of the genus proposed by him under the name of *Choniastron* (from χόνιον, a little barrel, and ἄστρον, a star, in allusion to the form of the corolla tube). This section is described as having persistent leaves, thirteen to fourteen long exserted stamens, and an infundibular corolla with a narrow cylindric tube as long as the lobes; some of which characters are not conspicuous in *R. scabrifolium*.

R. scabrifolium was discovered at an elevation of about eight thousand feet, on the mountains above Lankong, in the province of Yun-nan. Seedlings of it were obtained by Kew from the Jardin des Plantes, in the spring of 1888, which flowered in April, 1890. Along with it were received plants of *R. ciliicalyx*, *decorum*, *Delavayi*, *fastigiatum*, *hybridum*, *lacteum*, and *racemosum*, all from the same source.

February 1st, 1891.

Descr. A small rigid shrub, hispidly hairy all over, except the bracts, corolla, stamens, and style; branches strict terete. *Leaves* two and a half to three and a half inches long, elliptic- or oblong-lanceolate, acute at both ends, with the costa excurrent at the tip, margins ciliate slightly recurved, scabridly hispid above, with about seven pairs of impressed arched nerves which are very prominent and hispid beneath, under surface pale green, covered with minute lepidote scales; petiole very short. *Flowers* in loose terminal sub-umbellate fascicles; pedicels one to one and a half inch long, surrounded at the base by oblong scarious convex sub-acute imbricating pubescent yellowish bracts a quarter to one-third of an inch long. *Calyx* very small, hispid and lepidote, five-cleft, lobes ovate, acute. *Corolla* one and a half inch in diameter, white flushed with pink, tube short, campanulate; lobes oblong, obtuse, spreading, about twice as long as the tube. *Stamens* ten; filaments glabrous, slender and spreading, nearly as long as the corolla-lobes; anthers small. *Ovary* small, ovoid, five-celled, hispid and lepidote; style declinate, slender, hairy towards the base; stigma rather large, depressed-capitate, crenate. *Capsule* about twice the length of the calyx, oblong, obtuse, hispid.—*J. D. H.*

Fig. 1, Apex of leaf, seen from beneath, showing the lepidote scales and excurrent costa; 2, calyx and ovary; 3, anther; 4, ovary; 5, transverse section of the same; 6, calyx and very young fruit:—*all but fig. 6 enlarged.*

Tab. 7160.

TRICUSPIDARIA dependens.

Native of Chili.

Nat. Ord. Tiliaceæ.—Tribe Elaeocarpeæ.

Genus Tricuspidaria, *Ruiz & Pav.*; (*Benth. Hook. f. & Gen Pl.*, vol. i. p. 240.)

Tricuspidaria *dependens*, *Ruiz & Pav. Syst. Fl. Peruv. & Chil.* 112 (1798); *Gen. Pl. Fl. Per. & Chil.* 64, t. 36; *Ic. ined.* t. 403; *DC. Prodr.* vol. i. p. 520; *C. Gay Fl. Chil.* vol. i. p. 338; *Hook. Bot. Misc.* vol. iii. p. 155; *Miers Contrib.* vol. ii. p. 186.

T. Patagua, *Miers Contrib.* vol. ii. p. 182.

Tricuspis dependens, *Pers. Syn.* vol. ii. p. 9.

Crinodendron Patagua, *Car. Diss.* vol. v. p. 300, t. 158 (1793); *Hook. Bot. Misc.* vol. iii. p. 156, t. 160; *Miers Contrib.* vol. ii. p. 187, t. 82.

C. Hookerianum, *Miers Contrib. l. c.* p. 189, t. 83.

Patagua (Cinodendron) *Mol. Chil.*; *Ed. Angl.* vol. i. p. 146.

A small tree, attaining the height of thirty feet, apparently widely spread in the Chilian valleys, from Santiago in Lat. 34° S. to the island of Chiloe in Lat. 44° S. It was first noticed by Molina, who alludes to it in his "Saggio sulla storia Naturale del Chili," published in Bologna in 1782, a work translated into German, French, and English, and was subsequently described by Cavanilles from a drawing given him by Molina, as *Crinodendron Patagua*, a name which would be entitled to adoption were it not that the description is so imperfect and misleading that no botanist could have recognized the plant by it. This has led to its rejection by the elder De Candolle and most subsequent authors, for that given by Ruiz and Pavon. The late Mr. Miers, indeed, regarded *Cuspidaria* and *Crinodendron* as distinct genera, and further attempted to distinguish two species of *Tricuspidaria*, namely a *T. dependens*, R. & P., from South Chili, and *T. Patagua*, Miers (T. dependens, *Hook. Bot. Misc.*; Crinodendron Patagua, *Molina* and *C. Gay*), a native of the central provinces of Chili. The genus *Crinodendron* he confines to the *C. Patagua*, of Hook. Bot. Misc. (not of Molina), and names it *C. Hookerianum*, giving it the geographical area of South Chili and the Island of Chiloe.

February 1st, 1891.

C. Gay in his Flora of Chili, describes the Patagua as inhabiting valleys of the Cordillera between Concepcion and Santiago, at an elevation of three thousand seven hundred feet, and says that the wood is very white, good, and much used for building and joiners' work; but that it must not be confounded with the Patagua of Valdivia, which is a species of Arrayan with wood of a bad quality. Molina says the flowers are fragrant, and gives the dimensions of the trunk as such that four men can scarcely encompass it; but this last statement Miers discredits.

A plant of *Tricuspidaria dependens* has long been cultivated in the Temperate House at Kew, and flowers in spring. Its history is unknown. Mr. Watson informs me that the buds are very slowly developed, being formed in September, and then being as large as peas, but not fully developing till the following April, after which they remain for at least a month on the tree.

Descr. A small tree; branchlets, petioles, peduncles and calyx pubescent. *Leaves* three to five inches long, opposite and alternate, shortly petioled, lanceolate, acuminate, serrulate, nerves strong beneath. *Flowers* axillary, solitary, long peduncled, pendulous; peduncle ebracteate, two to two and a half inches long, stout, green speckled with red. *Sepals* five, pubescent, greenish-red, variously cohering and forming an irregularly dehiscent calyx. *Corolla* one to one and a quarter inch long, urceolate, blood-red, deeply ten grooved; petals linear, very fleshy, in duplicate-valvate, three-toothed at the tip, deeply inflexed margins and stout mid-rib within pubescent, base bisaccate. *Stamens* fifteen, inserted on a thickened hypogynous glandular disk, ten outer situated on the glands, five inner eglandular at the base; filaments slender, incurved, glabrous; anthers linear, as long as the filaments, pubescent, obtusely four-angled. *Ovary* villous, five-celled, cells many-ovuled. *Style* elongate, subulate, stigma minute.—*J. D. H.*

Fig. 1, Calyx; 2, petal seen from within; 3, disk, stamen, and pistil; 4, anther; 5, disk and ovary; 6, vertical section of ovary:—*all enlarged*.

M.S. del J.N.Fitch lith.

Vincent Brooks Day & Son Imp

Tab. 7161.

ANGRÆCUM FRAGRANS.

Native of Bourbon and the Mauritius.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Angræcum, *Thouars*; (*Benth. & Hook. f. Gen. Pl.* vol. iii. p. 583.)

Angræcum *fragrans;* caule crassitie pennæ olorinæ, foliis 3–4-pollicaribus patenti-recurvis linearibus lineari-oblongisve, apice 2-lobis lobis rotundatis, pedunculis unifloris foliis brevioribus suberectis 2–3-vaginatis, sepalis petalisque consimilibus patenti-recurvis linearibus obtusis albis, labello hastato-lanceolato, calcare gracili decurvo sepalis paullo longiore, columna brevi lateribus subauriculatis, polliniis apicem versus stipitis plani oblongi indivisi sessilibus.

A. fragrans, *Thouars Orchid. Iles Afric.* t. 54; *A. Rich. Orchid. Maur.* 69; *Lindl. Gen. & Sp. Orchid.* p. 246.

Ærobion fragrans, *Spreng. Syst. Veg.* vol. ii. p. 716.

Æranthus fragrans, *Reichb. f. in Walp. Ann.* vol. vi. p. 899; *S. Moore in Baker Fl. Maurit.* p. 350.

The interest attached to this little orchid is due to the persistent Vanilla-like odour of the leaves when dry, which has led to its use as a tea in Bourbon, the Mauritius, and even to some extent in France. According to a notice in the Gardener's Chronicle (1850, p. 599) of an article on this plant by a M. Gobley, communicated to the Chemical Gazette, it is considered a digestive, and even recommended in diseases of the respiratory organs. The popular name is variously spelled Fahame, Faham, Fahan, Fahon, Fahum, and Faam, of the origin of which I have no information. It is a native of both Bourbon and the Mauritius, from which last-named island plants were received in 1887 at Kew, from Mr. Horne, F.L.S., Director of the Botanical Gardens, Pamplemousses, which flowered in January of last year, and were very sweet scented.

With regard to the genus *Æranthus* to which *A. fragrans* is referred by Reichenbach and in the Flora of Mauritius, it is to be observed that it was founded by Lindley as *Æranthes* (altered to *Æranthus* in Veg. Kingd.), for the *Dendrobium Arachnites* of Thouars (Orch. Afr. t. 88), and another species, *A. grandiflora* (Bot. Reg. t. 817; Bot.

Mag. t. 6034, misspelt *Acranthus*), to which he incautiously added as a third a true *Angræcum*, the *A. sesquipedale*, Thouars. Of these the two first differ notably from *Angræcum* in habit and form of flower, in the elongate foot of the column, and the singular spur, and as Bentham remarks (Gen. Plant. iii. 576), they are more allied to *Ærides* than to *Angræcum*. Reichenbach, on the other hand, has without comment (Walp. Ann. vol. vi. 899) introduced a crowd of genuine *Angræca*, including *fragrans*, together with species of other very different genera, into *Æranthus*, Reichb. f., but omitting both Lindley's species, though at the same time citing *Æranthus*, Lindl., as a synonym of his *Æranthus*.

Descr. *Stem* six to ten inches long or more, about as thick as a goose-quill, scandent. *Leaves* few, towards the top of the stem, three to four inches long, by half to three-quarters of an inch broad, spreading and recurved, lorate, deeply two-lobed at the tip, lobes rounded, deeply channelled down the centre, margins recurved. *Flowers* solitary, axillary or supra-axillary; peduncle ascending or erect, with the ovary two to two and a half inches long, rather stout, sheaths and sheathing bract appressed. *Flowers* two inches in diameter across the sepals, pure white, fragrant; sepals and petals linear, spreading and recurved, obtuse. *Lip* about as long as the sepals, hastately lanceolate, acute, grooved down the centre; spur slender, rather longer than the sepals, green. *Column* very short, sides subauricled; anther hemispheric, ridged on the crown; pollinia attached one on each side of the acute apex of an oblong entire strap.—*J. D. H.*

Fig. 1, Flower with the sepals and petals removed; 2, column; 3, anther; 4 and 5, pollinia :—*all enlarged.*

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Tab. 7162-3.

ENCEPHALARTOS Altensteinii.

Native of South Africa.

Nat. Ord. Cycadeæ.—Tribe Encephalarteæ.

Genus Encephalartos, *Lehm.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 445.)

Encephelartos *Altensteinii*; trunco robusto apice plus minus villoso, foliis numerosissimis breviter petiolatis, petiolo subcylindraceo demum glabrato, rachi dorso rotundato, facie bicanaliculato, foliolis numerosissimis sessilibus lineari-oblongis pungentibus inermibus v. utrinque paucispinulosis læte viridibus, strobilo masculo elongato-ovoideo v. subclavato, squamis inferioribus et intermediis in conum crassum truncatum tetragonum productis, superioribus longioribus elongatis, strobilo fœmineo maximo subsessili ovoideo, squamis in conum crassum quadratum truncatum apice villosum rugosum productis, seminibus oblongis trigonis angulo interiore acuto lateralibus rotundatis.

E. Altensteinii, *Lehm. Pugill.* vi. p. 11, f. 4, 5 (1834); *Otto. et Dietr. Allgem. Gartenzeit.* 1834, pp. 85, 86, 88, tt. 4, 5; *Miquel Monogr. Cycad.* p. 51, *et in Linnæa*, vol. xix. p. 420, t. 5; *et Prodr. Cycad.* p. 10, 22; *De Vriese, Descr. et Fig. des Plantes Nouv. du Jardin de Leyden*, 1807, t. 1, 2, 3; *Oudeman. Medd. Enceph. Alt.* 1863, p. 1; *Alph, DC. Prodr.* vol. xvi. pt. ii. p. 532; *Masters in Gard. Chron.* 1876, pt. ii. p. 392, figs. 80, 81, 82, and 1887, pt. ii. p. 281, fig. 66.

E. Marumii, *De Vriese in Tijdschr. Nat. Gesch.* vol. v. p. 188.

The cone of *Encephalartos Altensteinii* here figured was the second sent to the Royal Gardens of Kew, by W. H. Tillett, Esq., of Sprowston, Norwich. The first, which arrived about thirteen years ago, had been left too long on the plant and hence was received in too dilapidated a state for drawing. The second (none having been formed in the interval) was received in February of last year in excellent condition. In each case the cone was about eighteen inches long by thirty in circumference, and was preceded by a tier of leaves formed in the previous year. It was accompanied by a photograph of the plant, which is reproduced on Plate 7163. Judging from the photograph, Mr. Tillett's plant precisely accords, except in size, with the specimens growing at Kew, the largest of which is nearly six feet in height with a diameter of trunk about ten inches.

March 1st, 1891.

The first description of the female cone of this noble Cycad in England was published by Dr. Masters in the "Gardener's Chronicle" for 1876, with excellent figures of the whole plant (male and female), its cones of both sexes, and leaves, from specimens that flowered in Mr. Bull's nursery. Except in its smaller size (twelve inches long by five and a half inches diameter, those of the cone here figured being eighteen inches long and ten inches diameter), and in the crowns of the scales being smooth and glabrous, and not at all tubercled, there is no appreciable difference between Mr. Bull's cone and Mr. Tillett's; and as the female cones were unknown when the species was first described, it is impossible to say which best accords with that of the type of the species.

An ample collection of available materials for a knowledge of *Encephalarti* has been collected by Mr. Thiselton Dyer, and is deposited at Kew. This repertorium includes a photograph of a female cone referred to *E. Altensteinii*, seventeen inches high and thirteen inches diameter, of an exactly oblong form, that was produced in the Botanic Garden of Grahamstown; in it the tips of scales are rugosely tubercled all over, and the truncate area is much less distinctly defined. There are also photographs of specimens with three cones from Sir Thomas Shepstone's garden at Natal; these photographs were numbered 43 and 73 in the Catalogue of Photographs in the Natal Department of the Colonial Exhibition of 1886, and are accompanied by notes from Mr. G. T. Ferneyhaugh, to the effect that one of the plants is supposed to be two hundred years old, and had produced cones for the first time (presumably after its being planted in Sir T. Shepstone's garden); and that the cones sometimes weigh thirty to forty pounds, and that the seeds of *Encephalarti* are valued for snuff-boxes by the natives of Natal.

Another very complete description, with illustrations, of *E. Altensteinii* is that of De Vriese in his "Description of new and rare plants that flowered in the Botanic Garden of Leyden." The figure which he gives of the female cone and its scales precisely accords with Mr. Tillett's plant in the tubercles and their woolly apices. De Vriese states that the species was named after a German Mæcenas of Science,

"M. le Comte d'Altenstein, Chancellor et Ministre d'État de S. M. le Roi de Prusse."

With regard to the geographical distribution of the South African *Encephalarti*, there is little information to be had. I find, however, in the Kew collection above alluded to, the notice of a meeting of the Phytologists Club (see Phytologist, 1852, p. 613) at which extracts were read from a letter from Charles Zeyher, dated Cape-town, April, 1852, to the effect that "*E. Altensteinii* is found in woods on the Boschman's River, not far from the virgin forests of Olifant's Hoek, where also *E. tridentatus* is found, but sparingly;" that is in the district of Albany, and not far from the sea-coast. Nor are there available authentic accounts of the height to which the species attain. In cultivation *E. Altensteinii* attains nearly six feet at Kew and elsewhere, with a diameter of ten inches to a foot, and the leaves are five feet in length; but that some species attain a very much greater height would appear from a letter addressed to me by the late Mr. Charles Meller, when in charge of the Botanical Gardens in Mauritius. Mr. Meller had returned from a visit to Natal, where he had been informed by Mr. Sanderson of a huge *Encephalartos*, which the latter gentleman had met with in a secluded valley of Natal, about thirty miles from the sea, the trunk of which measured sixteen feet before branching, and twenty-five to the crown, which was formed of five branches. It is probably *E. Altensteinii*.—*J. D. H.*

Tab. 7162, Cone and leaves of Mr. Tillett's plant, the cone reduced to one half of the natural size, the leaves of the natural size, as are fig. 1, the crowns of the scales; 2, upper and under surface of scales removed with the seeds, and f. 4, vertical section of seed.

Tab. 7163, Reduced sketch of Mr. Tillett's plants, from a photograph; and leaflets of the natural size from the Kew plant.

Tab. 7164.

MASDEVALLIA macrura.

Native of the Andes of New Granada.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Masdevallia, *Ruiz. & Pav.*; (*Benth. & Hook. f. Gen. Pl.* vol. iii. p. 492.)

Masdevallia (Coriaceæ) *macrura*; dense cæspitosa, foliis obovato-spathulatis obtusis in petiolum validum angustatis, pedunculis erectis validis foliis æquilongis unifloris, flore ad apicem pedunculi sessili amplo, bractea concava, perianthii carnosi tubo brevi campanulato, extus purpureo intus roseo rubro punctato, sepis e basi triangulari-ovata alte 7-carinata in caudas longissimas flavidas angustatis, carinis verrucosis, petalis carnosis oblanceolato-oblongis subacutis dorso carinatis, labello lineari-oblongo basi cordato, apice carnoso recurvo papilloso, columna apice membranacea cucullata.

M. macrura, *Reichb. f. in Gard. Chron.* 1874, pt. i. p. 240, and 1877, pt. i. p. 12, f. 2; in *Linnæa*, vol. xli. (1877), p. 11.

A discovery of the late Mr. Benedict Roezl in New Grenada, possessing as its describer (Professor Reichenbach) says, some considerable ornamental merits. This was in 1874; in 1877 a much fuller account of it (with a good figure) was given in the "Gardener's Chronicle," where it is stated that the tails of the sepals vary greatly in length, from a little over four to six inches, in eighteen specimens examined. Its most remarkable character is the presence of prominent nerves covered with numerous dark purple warts in the interior of the perianth.

The plant figured was obtained from Mr. W. Lee, Downside, Leatherhead, in 1887, and flowered at Kew in January, 1890.

Descr. *Stems* short, densely tufted, sheathed, bearing a solitary leaf and scape. *Leaves* with the stout petiole six to ten inches long, spathulately oblanceolate, two to three inches broad, very coriaceous, keeled dorsally, tip rounded entire or notched; petiole half as long as the blade or shorter, keeled at the back; basal sheaths several, large, obliquely obtusely truncate. *Peduncle* shorter than the leaf, stout, erect, one-fld., green, slightly curved. *Flower* large, eight

inches long from the tip of the erect dorsal sepal to those of the deflexed lateral sepals, sessile on the top of the peduncle ; bracts cucullate, truncate, green, sheathing the short ovary and the base of the perianth. *Sepals* coriaceous connate below in a short, broadly campanulate tube, which is bright red purple externally ; segments broadly triangular-ovate, two-thirds of an inch wide at the base, dull red within with dark purple spots, narrowed into long slender yellow cylindric tails, the dorsal erect, the lateral pendulous, strongly seven-ribbed without and within, the ribs smooth without, warted within. *Lip* linear-oblong, base cordate, tip fleshy, obtuse, recurved, papillose. *Petals* oblanceolate, truncate.—*J. D. H.*

Fig. 1, Petals, lip, and column *in situ* ; 2, column ; 3, anther ; 4, pollinia :—*all enlarged.*

M.S. del, J.N. Fitch. lith.

Vincent Brooks Day & Son, Imp.

Tab. 7165.

MASDEVALLIA PUNCTATA.

Native of the Andes of New Granada?

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Masdevallia, *Ruiz & Pav.*; (*Benth. et Hook. f. & Gen Pl.*, vol. iii. p. 492.)

Masdevallia *punctata*; dense cæspitosa, foliis petiolatis elliptico-lanceolatis acuminatis, pedunculis subæquilongis gracillimis pendulis 1-plurifloris pluri-vaginatis, perianthio incurvo latiore quam longo luride flavido creberrime sanguineo punctato, sepalo dorsali amplo ovato incurvo in caudam rigidam angustato dorso crasse 3-costato, sepalis lateralibus divaricatis et incurvis falcato-ovato-lanceolatis obtusis, basi gibbis apice seta mucronatis, petalis dolabriformibus acutis, labello lineari recurvo.

M. punctata, *Rolfe in Gard. Chron.* 1888, pt. ii. p. 323.

Mr. Rolfe, the founder of this pretty little species, describes it as belonging to a small group of the genus in which the lip is superior in relation to the axis of the inflorescence, and as most nearly allied to *M. swertiæfolia*, Reichb. f. (Gard. Chron., 1880, ii. 390). From the last-named plant it differs in the much larger flower and the elongate falcately decurved lateral sepals, which give the very broad flower somewhat the appearance of a bison's head. *M. swertiæfolia* is further described as having soft leaves, sepals with slender recurved tails, and a sagittate lip serrulate in front. The plant was procured from Messrs. Backhouse and Sons of York, in 1888, and flowered at Kew in the same year. Its precise native country is unknown, but is presumably the Andes of New Granada.

Descr. Densely tufted. *Leaves* three to five inches long, by three-fourths to one inch broad, elliptic-lanceolate, subacute, narrowed below into a petiole one-third to half inch long, which is embraced at the base by a single tubular brownish sheath, very coriaceous, bright green. *Peduncles* about as long as the leaves, very slender, pendulous, purplish, one to three or four flowered, the flowers appearing one at a time; sheaths three to four, about one-sixth of an inch long, acute. *Flowers* ascending, strongly incurved; about a third of an inch across the lateral sepals; bracts

very small; ovary short, red; perianth with a hemispheric base, dull yellowish, thickly speckled with crimson. *Dorsal sepal* very broadly ovate, concave, narrowed into a long stiff incurved tail, thickly five-ribbed on the back. *Lateral sepals* spreading horizontally, falcately incurved, ovate-lanceolate from a gibbous base, and with a filiform excurrent process within the tip. *Petals* hatchet-shaped; that is subdimidiate-ovate in form, narrowed at the base, acute. *Lip* linear-oblong, recurved, yellow upwards. *Column* three-toothed.—*J. D. H.*

Fig. 1, Flower; 2, the same with the sepals narrowed; 3, column; 4 and 5, anther:—*all enlarged.*

M.S. del, J.N.Fitch, lith.

Vincent Brooks Day & Son, Imp.

Tab. 7166.

CLEMATIS Stanleyi.

Native of the Transvaal.

Nat Ord. Ranunculaceæ.—Tribe Clematideæ.

Genus Clematis, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 3.)

Clematis Stanleyi; erecta, robusta, molliter albo-villosa, foliis ternatisectis, foliolis laxis densisve cuneato-obovatis v. -linearibus obtusis v. acutis, floribus solitariis longe et crasse pedunculatis amplis nutantibus, sepalis 4 ovato-rotundatis subacutis valide costatis marginibus undulatis intus et extus sericeo-villosis albis v. pallide purpureis, staminibus numerosissimis, filamentis sericeis antheras lineares longioribus, ovariis stylis que sericeo-plumosis.

C. Stanleyi, *Hook. Ic. Pl.* t. 589; *Harv. & Sond. Fl. Cap.* vol. i. p. 3; *Watson in Gard. Chron.* 1890; pt. ii. p. 326; *Garden & Forest*, vol. iii. p. 513.

Few genera of plants present such remarkable divergences in habit and flowers as *Clematis*, and the subject of the present plate shows, perhaps, in this respect the greatest departure from the prevalent characters of its congeners. In fact it more resembles an *Anemone* in foliage and flower, though no species of that genus has so shrubby a habit; and the North American *A. patens* is its nearest counterpart in general appearance. Mr. Watson, indeed, informs me that as grown at Kew the leaves are sometimes alternate, a singular fact, which if confirmed, would leave nothing whereby to distinguish the two genera from one another but the valvate petals of *Clematis*, these being imbricate in *Anemone*.

C. Stanleyi, whilst always retaining its erect robust habit, is a very variable plant as to foliage, whether in its native state or in cultivation. The leaves are sometimes only a few inches long, crowded and with closely packed sessile leaflets not a fourth of an inch long; in others the leaves are four to six inches long, with linear segments; in the cultivated form here figured the lower leaves are a span long and upwards; deltoid, with petiolulate segments an inch to an inch and a half long. The peduncles of the

flower are always erect with the flowers drooping, they vary from two to three inches long in dwarf compact leaved native specimens, to eight and ten inches in the cultivated, and the flowers vary from one to nearly three inches in diameter, and in colour from white to pink-purple. The sepals expand widely before falling off.

According to the "Flora Capensis" *C. Stanleyi* was discovered by Miss Owen, in Zululand, in 1840. It was refound in about 1842 by Mr. Burke, a collector sent out to South Africa under the joint auspices of the Royal Gardens of Kew and the Lord Derby (grandfather of the present Earl), whose gardens and menagerie at Knowsley were famous nearly half a century ago, but of which the menagerie was broken up at his death, and the gardens were no longer kept up on a botanical footing. Mr. Burke found the plant at Macalisberg, in about the centre of what is now the Transvaal, and it has been collected in the same region and in Natal by the late Mr. Sanderson, by Mr. Nelson, and Dr. A. Rehmann.

The specimen here figured was raised from seed sent to Kew by Mr. E. E. Galpin, of Barbertown in the Transvaal. Plants of it flowered freely in the summer both in an open sunny border and in the greenhouse at Kew, and ripened seed. The roots, Mr. Watson informs me, are fleshy like those of *C. vitalba*.—*J. D. H.*

Fig. 1 and 2, stamens; 3, carpel:—*both enlarged.*

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Tab. 7167.

VANILLA planifolia.

Native of Mexico.

Nat. Ord. Orchideæ. Tribe Neottieæ.

Genus Vanilla, *Swartz.* (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 590).

Vanilla *planifolia;* caule robusto tereti, foliis breviter crasse petiolatis oblongo-lanceolatis longe acuminatis crassis nervis obscuris, racemis multifloris breviter pedunculatis, rachi crassa, pedicellis incurvis, floribus amplis flavescentibus, sepalis petalisque oblanceolatis labelli tubo buccini-formi intus penicillo columnæ anteposito instructo, limbi parvi lobis revolutis crenulatis lateralibus brevibus intermedio retuso creberrime striato-carinato carinis crenulatis, columna antice villosa capsula 8–9-pollicari.

V. planifolia, *Andrews Bot. Rep.* vol. viii. t. 538; *Lodd. Bot. Cab.* t. 733; *Lindl. Gen. & Sp. Orchid.* p. 435; *Blume, Rumphia,* vol. i. p. 198, t. 68; *Hayne Arzneigew.* vol. xiv. t. 22; *Morren, in Bull. Acad. Sc. Bruxelles,* iv. (1837) 225; xvii. (1850) 108; *in Comptes Rendu Acad. Fr.* (1838) 489; *Berg. et Sch. Offic. Gewächse,* vol. xxiii. t. a, b; *Delteil, Etudes sur la Vanilla,* 1874; *De Vriese, De Vanielzè.* p. 22; *Köhler Mediz. Pflanz.; Benth. & Trim. Med. Pl.* vol. iii. t. 272; *Flück. & Hanbury Pharmacograph.* Ed. 2, p. 657.

V. viridiflora, *Blume Bijdr.* p. 422.

Myrobroma fragrans, *Salisb. Parad. Lond.* t. 82.

Vanilla flore viridi et albo, fructu nigrescente, *Plum. Nov. Gen. Pl. Am.* 25 (1703).

Araco aromatico, *Hernandez Thesaur., Rer. Med. Nov. Hisp.* 38 (1651), with fig.

An excellent account of the History of the Vanilla is given in Hanbury and Flückiger's Pharmacographia cited above, from which I have taken the following account. According to these authors it was found to be used by the natives of Mexico as a condiment to chocolate on the occupation of that country by the Spaniards, who introduced it into Europe. The first botanical notice of it is by Clusius, in his "Exoticorum Libri," lib. iii. c. 18, 72 (1605), who received a specimen of it from Morgan, apothecary to Queen Elizabeth, in 1602, and who described it as "Lobus oblongus aromaticus," without being aware of its native country or uses. It was, however, known much earlier to Hernandez, for the figure in his Thesaurus, which appeared in 1651, was one of a series of 1200 executed at great cost in Mexico, by order of the King of

Spain, during the previous century. In 1703 Plumier first gives it the name of *Vanilla*, that being the name in use in Mexico by the Spaniards; and he enumerates three species, distinguishing *planifolia* by its white or green flower and black fruit. At the end of the seventeenth century it was imported into France through Spain, and used for flavouring chocolate and scenting tobacco. In 1721 it had a place in the London Pharmacopœia, but gradually disappeared from the druggists' shops, finding a refuge with increasing favour with the confectioners. For many years the principal imports were from Mexico, but latterly the French, Dutch, and English colonies, especially Bourbon, Java, the Mauritius, and Honduras, chiefly meet the European demand.

Of the numerous published figures of *V. planifolia* one alone much resembles the one here given, and that is W. Hooker's (not a connection of the former Editor of this Magazine) in Salisbury's Paradisus, and which is excellent. It was taken from the plant first cultivated in this country (in the garden of the Rt. Hon. Charles Greville, at Paddington). The original figure of Andrews' Repository, taken from the same plant a few years earlier, is represented as having smaller very dark green leaves, and much smaller blueish white flowers with shorter sepals and petals. Loddiges' figure resembles that of Andrews'; and what is more strange, so does that given by Bentley and Trimen, which is stated to be drawn from a Kew plant. So great is the difference between Andrews' figure and that here given, that were it not that Hooker's is said to be drawn from the same plant as Andrews', I should doubt their specific identity. In colour the flowers evidently vary from greenish-white to yellow, and they may vary considerably in size also. The figure here given was made from a Kew plant in May, 1890, obtained originally from the Duke of Northumberland's Gardens at Sion House. On numerous occasions, during the last ten years, the Sion House plants, as also the Kew plants obtained from them, have produced mature pods. These are about eight or nine inches long, somewhat slender, and possess the characteristic aroma of true vanilla.—*J. D. H.*

Fig. 1, Portion of lip and column; 2, top of column and anther; 3, back, and 4, front view of anther:—*all enlarged.*

Tab. 7168.

ASARUM geophilum.

Native of Southern China.

Nat. Ord. Aristolochieæ.

Genus Asarum, *Linn.*; (*Benth. et Hook. f. Gen. Pl.*, vol. iii. p. 122.)

Asarum *geophilum*; sparse hirsutum, caudice robusto repente, foliis alternis crasse petiolatis rotundato-cordatis obtusis ciliatis luride viridibus superne nervis albidis reticulatis, floribus axillaribus, pedunculis crassis decurvis, ovario infero late hemispherico, calycis tubo brevi intus hirsuto, ore breviter annulato, limbo 3-lobo atro-purpure albo punctato molliter setuloso aureo marginato, lobis ovato-rotundatis antico majore, antheris oblongis connectivo producto obtuso, stylo brevi alte 6-sulcato, stigmatibus brevibus decurrentibus.

A. geophilum, *Hemsl. in Gard. Chron.* 1890, vol. i. p. 422.

Under *Asarum caudigerum*, figured in plate 7126 of this work, I alluded to the many accessions to this curious genus which had been discovered of late years in China, from which country alone Mr. Hemsley informs me that eight species are known. Amongst these species there are very great differences both in mode of growth and floral structure. Thus *A. geophilum* differs from its congeners in its elongate branching rhizome with distant alternate leaves; *A. caudigerum* in its binate leaves, with pairs of large green sheaths (cataphylla) at the base, in the caudate perianth lobes and triseriate stamina; *A. macrantha* (Plate 7022) in its crowded large flowers, and the mouth of the perianth being almost closed by a horizontal lamina, as in its near ally *A. virginicum* (*Heterotropis asaroides*, Tab. 3746). There are further great modifications in the forms of the stamens and styles in the various species; and in the ovary which may be wholly inferior or almost superior.

On these and other modifications A. Braun and Duchartre have laid the foundation of four sections of the genus (see DC. Prodr. vol. xv. pt. i. p. 423), which are for the most part natural, but which will require considerable modification, and the addition of others, to receive the numerous species which have to be added to the ten described in the Prodromus.

April 1st, 1891.

Asarum geophilum was procured by Mr. Ford, Superintendent of the Hong-Kong Botanical Gardens, from the province of Kwantung in Southern China in 1888. Living plants, from which the accompanying drawing was made, were sent to Kew by that zealous explorer, and flowered in a cool greenhouse in November, 1889.

Descr. Whole plant more or less softly hairy. *Root-stock* as thick as a swan's quill, creeping and branching, red-brown, as are the petioles, leaf-nerves beneath, and peduncles. *Leaves* alternate, distant, three to four inches in diameter, orbicular-cordate, obtuse, ciliate, deep green above with closely reticulate white nerves, pale green beneath; petiole two to three inches long, stout. *Flowers* axillary, solitary; peduncle stout, about half an inch long, decurved. *Flowers* an inch in diameter; ovary broadly hemispheric, wholly inferior. *Perianth-tube* short, and as well as the flat lobes, covered with soft setæ; mouth constricted, annulate; lobes three, orbicular-ovate, obtuse, dark red-purple with white spots, and margined with golden yellow, the anticous rather longer than the others. *Stamens* equal, filaments short; anthers oblong, connective produced into an obtuse cone. *Style* short, deeply laterally six-cleft, with short decurrent stigmas.—*J. D. H.*

Fig. 1, Flower with half the perianth removed; 2 and 3, stamens; 4, style:—*all enlarged.*

M.S. del, J.N. Fitch lith

Vincent Brooks, Day & Son Imp

Tab. 7169.

EPIDENDRUM Sceptrum.

Native of Venezuela and New Grenada.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Epidendrum, *Linn.*; (*Benth. & Hook.f. Gen. Pl.* vol. iii. p. 528.)

Epidendrum (Aulizeum) *Sceptrum*; pseudobulbis stipitatis elongatis apices versus paucifoliatis, foliis erecto-recurvis loriformibus apicibus rotundatis emarginatis v. breviter 2-lobis, racemo basi spathaceo elato stricto multifloro, bracteis minutis ovatis, pedicellis cum ovariis 1–1½ pollicaribus strictis, floribus 1–1¼ poll. diam. aureis rubro-purpureo maculatis, sepalis lanceolatis acutis, petalis latioribus spathulato-oblanceolatis acutis, labello columnæ adnato trapezoideo angulis obtusis glaberrimo, basi pulvinato, columna brevi viridi, clinandrio trilobo.

E. Sceptrum, *Lindl. Orchid. Linden.* No. 50; *Fol. Orchid. Epidendrum*, p. 36, No. 111; *Reichb.f. in Bonpland*, vol. ii. p. 281; *in Walp. Rep.* vol. vi. p. 353.

A very striking species, and with a rather wide distribution for an epiphytic Orchid; extending along the coast ranges of the Caribbean Sea, from Cumana, where it was found by Linden at an elevation of 6500 feet, to Santa Martha, in New Grenada, and to Ocaña in the interior of the same republic. It belongs to a section of the genus in which the lip is more or less adnate to the whole length of the column (less in this species), and with few leaves at the top of the pseudobulb, and terminal inflorescence. Of species figured in this work it comes nearest to *E. variegatum* (Plates 3151) of which *E. coriaceum* (Plate 3595) is undoubtedly a variety, and not a very marked one.

E. Sceptrum was first flowered in this country by the late Mr. Warner, who sent a flowering raceme to Kew in 1864. Sir Trevor Lawrence again flowered it in 1888, and presented the plant to Kew, from which the accompanying figure was made in September, 1889.

Descr. *Rootstock* creeping, rigid. *Pseudobulbs* stipitate, a span to a foot long, very narrowly fusiform, nearly an inch in diameter, slightly compressed, clothed at the base with a lanceolate brown sheath; stipes one to two inches

long, clothed at first with short imbricating brown sheaths; a small oblong pseudobulb usually crowns the larger one, and bears the flowering raceme. *Leaves* one to three at the tips of the pseudobulb, a span to a span and a half long, about an inch in breadth, erect and recurved, strap-shaped, bright green, coriaceous, tip rounded and notched, or two-lobed, lobes rounded. *Raceme* about a foot long, strict, erect, very many-flowered, rachis pale green; peduncle short, with a narrow brown basal sheath; bracts an eighth of an inch long, ovate, green; pedicels with ovary an inch to an inch and a half long, rather slender, strict, spreading. *Perianth* one to one and a quarter inches broad, bright yellow blotched with red-purple. *Sepals* spreading, lanceolate, acute. *Petals* broader, oblanceolate or subspathulate, acute. *Lip* adnate to the column for about one half the length of the latter, trapeziform with obtuse angles, golden yellow with confluent purple blotches towards the tip; disk glabrous, thickened towards the base. *Column* rather short, green, top three-lobed. *Anther* didymous; pollinia connate.—*J. D. H.*

Fig. 1, Lip; 2, column; 3, anther; 4 and 5, pollinia:—*all enlarged.*

4

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3

1

M.S. del, J.N. Fitch lith

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Tab. 7170.

FURCRÆA Bedinghausii.

Native of Mexico.

Nat. Ord. Amaryllideæ.—Tribe Agaveæ.

Genus Furcræa, *Vent.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 739.)

Furcræa *Bedinghausii;* caulescens, foliis dense rosulatis ensiformibus 3–4-pedalibus recurvatis facie lævibus dorso scabris valde glaucescentibus marginibus denticulatis, floribus in paniculam amplam ramis elongatis pendulis compositis dispositis, pedicellis brevibus aggregatis apice articulatis, bracteis parvis scariosis, ovario cylindrico, perianthio albo segmentis interioribus oblongis exterioribus lineari-oblongis dorso viridi tinctis, staminibus perianthio brevioribus filamentis valde strumosis, pistillo staminibus æquilongo.

F. Bedinghausii, *K. Koch. Wochen.* 1863, 233; *E. Morren in Belg. Hort.* 1863, 327, with figure; *Baker in Gard. Chron.* 1879, vol. i. p. 656; *Handb. Amaryll.* p. 203.

F. Roezlii, *André in Rev. Hort.* 1887, p. 353, fig. 1.

Roezlia bulbifera, *Roezl. in Belg. Hort.* 1883, p. 133 (name only).

This is a most distinct and interesting species of *Furcræa*, with the habit of a dwarf form of *F. longæva*, but with leaves resembling those of a *Beschorneria* in their texture and denticulate margin. It was discovered by Roezl in the year 1860 on Mount Acasca, which is situated seven or eight German miles south of the city of Mexico, and was introduced by him into cultivation. It was first flowered in 1863 by M. Bedinghaus of Mons, in Belgium, after whom it was named by Dr. Karl Koch. It is now widely spread in gardens, and has borne a variety of names in garden catalogues, such as *Yucca Parmentieri*, *Y. argyrophylla*, *Y. Toneliana*, and *Roezlia regia*. It has been flowered more than once in the open air in Scilly by Mr. Dorrien Smith, and in various places in England, always under cover so far as I know. Our drawing was made from a plant flowered in the summer of 1890 by E. H. Woodhall, Esq., of St. Nicholas House, Scarborough.

Descr. *Trunk* reaching sometimes a length of five or six feet below the rosette and a diameter of six or nine inches.

April 1st, 1891.

Leaves in a dense rosette, ensiform, three or four feet long, three or four inches broad at the middle, narrowed gradually to the point and to an inch above the dilated base, recurved, nearly smooth, and but little glaucous on the upper surface, very glaucus and scabrous on the under surface, with minutely denticulate edges. *Peduncle* stiffly erect, about as long as the leaves. *Inflorescence* a lax panicle ten or twelve feet long, with many long pendulous compound branches; pedicels short, aggregated, articulated at the apex; bracts small, brown, membranous. *Ovary* cylindrical, under an inch long. Expanded *perianth* two inches in diameter, white; inner segments oblong; outer linear-oblong, tinted with green outside. *Stamens* shorter than the perianth; filaments very strumose in the lower half; anthers versatile. *Pistil* as long as the stamens; lower part of the style strumose and deeply trisulcate; upper part subulate.—*J. G. Baker.*

Fig. 1, Portion of leaf, showing the under surface and margin; 2, a single stamen; 3, another stamen; 4, style and stigma:—*all enlarged.*

Tab. 7171.

ROSA Banksiæ.

Native of China.

Nat. Ord. Rosaceæ.—Tribe Roseæ.

Genus Rosa, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 625.)

Rosa *Banksiæ*; alte scandens, glaberrima, eglandulosa, lævis, caule aculeato ramulis inermibus, foliis 3–5-foliolatis, foliolis elliptico- v. ovato-lanceolatis acutis v. subacutis serrulatis v. crenato-serrulatis lævibus, stipulis anguste linearibus setaceisve demum deciduis, umbellis multifloris, floribus inter minoribus aureis, pedicellis gracilibus, calycis tubo brevi subgloboso, lobis breviusculis lanceolato-subulatis integerrimis v. obscure subserrulatis deciduis intus puberulis, petalis obcordatis concavis, filamentis gracilibus, antheris aureis, carpellis pilosis, stylis exsertis stigmatibusque capitatis liberis, fructibus parvis globosis, carne parca, carpellis maturis ad 8 triquetris glabris.

R. Banksiæ, *R. Br. in Ait. Hort. Kew.* Ed. ii. vol. iii. p. 258; *Lindl. Monogr. Ros.* t. 131; *Bot. Mag.* t. 1954 (var. *alba*); *Red. et Thor. Ros.* vol. ii. p. 43, *cum Ic.*; *Bot. Reg.* t. 1105, et t. 397 (var. *alba*); *DC. Prodr.* vol. ii. p. 601; *Hemsl. in Journ. Linn. Soc.* xxiii. p. 248.—Flores in omnibus pleni.

R. Banksiana, *Abel, Narr. Journ. Chin.* p. 160.

R. inermis, *Roxb. Hort. Beng.* p. 38; *Fl. Ind.* vol. ii. p. 576.

Under the description of *Rosa multiflora* (Plate 7119), I mentioned that I hoped soon to figure in this work another rose that had long been known in cultivation, but only in late years in its single state, *R. Banksiæ*. Thanks to the Rev. Canon Ellacombe I am now able to do this; and though I have nothing absolutely novel to add to the history of this beautiful plant, I may accompany the figure with a brief *résumé* of what has been recorded.

Rosa Banksiæ was first described in 1871 by R. Brown, in Aiton's Hortus Kewensis, where it is stated to have been introduced into England (presumably to Kew) from China in 1807 by Mr. William Kerr. It is not stated whether the plant was white- or yellow-fld., nor whether single or double fld. That it was however the white and double fld. is certain, for the next published account of it is in the volume for 1818 of the Botanical Magazine, where it is represented (Plate 1954) in this condition, the specimen having been obtained from Sir Joseph Banks' garden at Springrove, Isleworth (now the residence of Mr. Pears, the energetic manufacturer of soap). Though

delicate, it at once became a favourite under the name of "The Lady Banks' rose," or the "Rose without a thorn," the latter a hardly correct name. In 1819 it was figured in the *Botanical Register* (Plate 397) in the same white double condition, and from the same garden, where it had attained twenty feet in height or more, and with the remark that the single flowered variety had been found by Dr. Abel growing on the walls of Nankin. In 1820 Lindley's admirable *Monograph of Roses* was published, in which the double white again appears as the only form known. In 1827 the double yellow is for the first time figured, and by Lindley in the volume of the *Botanical Register* (Plate 1105), with the observation that the first indication of its existence is to be found in a note (overlooked when elaborating the Monograph) in Roxburgh's Hortus Bengalensis, where under the name of *R. inermis* both the double white and double yellow are alluded to with their Chinese names, as they were also in the Roxburghian MSS., preserved in the Banksian library. It was on discovering this, after the publication of the *Monograph of Roses*, that the Royal Horticultural Society, of which Lindley was secretary, directed Mr. John Damper Parks (who was being sent to China in 1823 by the Society) to obtain the yellow form, which he did, returning with it in 1824. Dr. Lindley describes it as, on the whole, a more desirable plant than the white variety, being more hardy, flowering more freely, and having deeper green leaves, but adds that it is less fragrant. The only other early notice of this plant is by Dr. Abel in his narrative of his travels in China, to which country he went as physician to Lord Macartney's embassy. Abel mentions it as *R. Banksiana*.

Indigenous specimens of *R. Banksiæ* are in the Kew Herbarium collected in the Ichang province on the Nan-t'o Mountains by Dr. Henry, and in Yun-nan, by the Abbé Delavay, also from Japan (Siebold). The single yellow form was sent to Kew by Mr. Hanbury, from his magnificent garden of the Palazzo Orengo, near Mentone, in 1871, and by Messrs. Paul and Son, from Cheshunt, in 1887. As stated above, the specimen figured is from Canon Ellacombe's garden at Bitton, near Bath, where it is quite hardy.— *J. D. H.*

Fig. 1, Stamen; 2, vertical section of calyx-tube, showing carpels; 3, carpels:—*all enlarged.*

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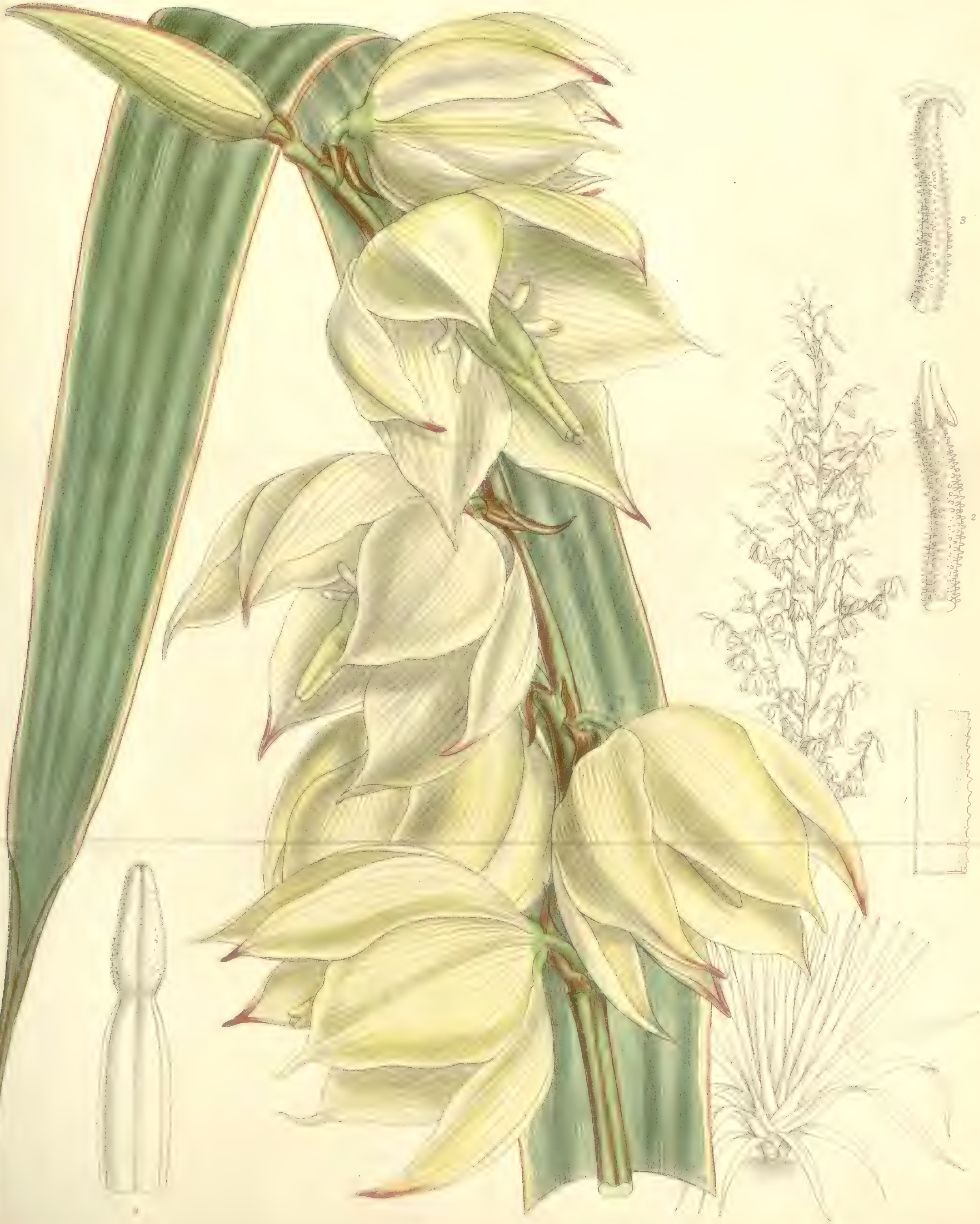

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Tab. 7172.

YUCCA RUPICOLA.

Native of Southern United States and Mexico.

Nat. Ord. Liliaceæ. Tribe Dracæneæ.

Genus Yucca, *Linn.* (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 778).

Yucca *rupicola;* subacaulis, foliis pluribus dense rosulatis ensiformibus rigidis viridibus 1½–2-pedalibus apice pungentibus marginibus corneis minute serrulatis, pedunculo foliis longiori, floribus in paniculam amplam laxam oblongam dispositis ramis ascendentibus, pedicellis brevibus apice articulatis, bracteis ovatis scariosis, perianthio magno campanulato albido segmentis acutis ovatis vel oblongis, staminibus ovario æquilongis filamentis muricatis, stylo ovario cylindrico-trigono breviori stigmatibus parvis, fructu capsulari oblongo rostrato, seminibus tenuibus.

Y. rupicola, *Scheele in Linnæa*, vol. xxiii. (1850) p. 143; *Engelm. Monogr.* p. 48; *S. Wats. in Proc. Amer. Acad.* vol. xiv. p. 253; *Baker in Gard. Chron.* 1870, p. 828; *Journ. Linn. Soc.* vol. xviii. p. 222.

Y. lutescens, *Carrière in Rev. Hort.* vol. vii. (1858), p. 579.

Y. tortifolia, *Lindheim. inedit.*

There are three distinct types of Yucca in leaf-character. The first group has the leaf margined with minute horny teeth, the second with a narrow entire brown horny border, whilst in the third the margin breaks up into slender wiry threads. The present plant is the only species of the first group which is hardy anywhere in England. It is a native of Texas, New Mexico, and the northern provinces of Mexico. It was gathered lately by Mr. C. G. Pringle on rocky hills near Chihuahua, flowering in the middle of April and producing fruit in May. It was introduced into cultivation by M. Trecul, from Texas, about the year 1850, but is still rare in English gardens. Our drawing was made from a plant which flowered with Canon Ellacombe at Bitton in the autumn of 1890.

Descr. Nearly or quite acaulescent. *Leaves* densely rosulate, pale green, ensiform, stiffly suberect, above two feet long, an inch and a half broad at the middle, narrowed gradually to a long pungent point and to half an inch above the clasping base, margined with a minutely-toothed horny brown border. *Peduncle* stout, erect, a little longer

than the leaves. *Panicle* lax, oblong, five or six feet long; branches slender, ascending, the lower a foot or more long; pedicels half or three-quarters of an inch long, articulated at the apex; bracts moderately large, ovate, brown, scariose. *Perianth* drooping, campanulate, milk white, two inches or more long; segments acute, the outer oblong, the inner broader, ovate. *Stamens* as long as the ovary; filaments cylindrical, densely minutely muricated; anthers emarginate at both the apex and base. *Ovary* cylindrical-trigonous, above half an inch long; style shorter than the ovary; stigmas small. *Fruit* hard, dry, oblong, rostrate, an inch and a half long. *Seeds* thin.—*J. G. Baker.*

Fig. 1, Margin of the leaf; 2 and 3, stamens; 4, pistil:—*all more or less enlarged.*

M.S. del., J.N. Fitch, lith.

Vincent Brooks, Imp.

Tab. 7173.

HERMANNIA cristata.

Native of South Africa.

Nat. Ord. Sterculiaceæ.—Tribe Hermannieæ.

Genus Hermannia, *Linn.*; (*Benth. & Hook. f. Gen. Pl.* vol. i. p. 223.)

Hermannia *cristata*; fruticulus scabride stellatim-pubescens, laxe foliosus, foliis subsessilibus oblongis v. oblongo-lanceolatis acutis crenato-serratis basi rotundatis v. cuneatis, stipulis subulatis, floribus axillaribus, pedicellis gracilibus, bracteis minimis, calycis campanulati lobis triangularibus acutis v. acuminatis, petalis unguiculatis limbo suborbiculari, filamentis spathulato-oblanceolatis acutis ciliatis, antheris petala subæquantibus angustis acuminatis, capsula subspherica tomentosa angulis processubus filiformibus incurvis demum rigidis pectinatim cristatis.

H. cristata, *Bolus in Journ. Linn. Soc.; Bot.* vol. xxv. p. 156.

The *Hermannie* are natives of Africa (chiefly South (Africa with a few Mexican and Texan. Upwards of seventy species are known from the first named country. Few are possessed of any beauty, though in the old days of dry stove and greenhouse cultivation, some of the more attractive found favour in what was called the "Cape House." Twenty-six species are enumerated in the Hortus Kewensis as to be found in English gardens at the beginning of the century, and five are figured in early volumes of this work, of which *H. flammea* (Tab. 1349) deserves a place in any conservatory. And the same may be said of the species here figured, which is, botanically, a very curious one, inasmuch as, as Mr. Bolus (an excellent South African botanist and the author of the species) points out, it differs from all its South African congeners (known to him), and approaches the American H. texana in the broad crests of its capsule.

H. cristata is a native of the eastern districts of South Africa and has a wide range, from the Transvaal to Griqualand, Natal, the Orange Free State, and Basuto-land—that is half across the continent, in lat. 29 S. Mr. Bolus describes the flowers of native specimens as of a beautiful crimson, a hue which they have not attained under the

gloomier skies of Kew. The plant was discovered by the late Dr. Sutherland near the Klip river, alt. three thousand five hundred to four thousand five hundred feet, in 1858, and has been subsequently collected by many travellers. The specimen here figured was raised from seeds sent to the Royal Gardens in May, 1890, by Mr. E. E. Galpin, of Barberton, Transvaal, and it flowered in the Cape House in autumn of the same year.

Descr. Roughly pubescent with stellate hairs. *Root-stock* woody, sending up ascending stems twelve to eighteen inches high, that are simple or branched from the base, and are sparsely leafy throughout. *Leaves* one to one and a half inch long, sessile or shortly petioled, linear-oblong, acute, crenate-serrate or toothed, pale green; stipules minute, linear-subulate. *Flowers* solitary in the axils of the upper leaves, cernuous; pedicels slender, one-half to one inch long; bracts minute, setaceous. *Calyx* half an inch long, campanulate, five keeled, green; lobes triangular, acute or acuminate. *Petals* twice as long as the calyx, with a slender incurved claw and orbicular bright brick-red limb, the margins of which are recurved. *Filaments* spathulate, ciliate; anthers very narrow, acuminate, ciliate. *Ovary* five-winged, style slender. *Capsule* one-half to nearly an inch long and broad, stellately tomentose, angles pectinately crested with ascending spines.—*J. D. H.*

Fig. 1, Petal; 2, stamens and style; 3, dorsal, and 4, ventral view of stamen; 5, young fruit:—*all enlarged.*

1

2

WAHLENBERGIA UNDULATA.

Native of South Africa.

Nat. Ord. Campanulaceæ.—Tribe Campanulaceæ.

Genus Wahlenbergia, *Schrad.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 555.)

Wahlenbergia *undulata;* decumbens, hispida v. glabriuscula, caulibus e rhizomate tuberoso elongatis superne ramosis inferne foliosis, foliis parvis sessilibus linearibus v. lineari-lanceolatis crenatis acutis undulatis setaceo-ciliatis marginibus cartilagineis, pedunculis elongatis gracilibus calycis glabri tubo anguste obconico striato, lobis subulato-lanceolatis ciliatis glabrisve, corolla infundibuliformi-campanulata tubo lobis calycinis duplo longiore, lobis ovatis acutis, filamentis a basi ampla obovata marginibus recurvis ciliata repente filiformibus, antheris lineari-oblongis, capsula obconica.

W. undulata, *Cham. in Linnæa*, vol. viii. p. 194; *A.DC. Monog. Campan.* p. 148, and in *DC. Prodr.* vol. vii. p. 435; *Harv. & Sond. Fl. Cap.* vol. iii. p. 579.

W. bilocularis, *A.DC. in DC. Prodr. l. c.* p. 439.

W. striata, *A.DC. l. c.* p. 439.

W. Chamissoniana, *G. Don. Gen. Syst. Gard.* vol. iii. p. 740; *A.DC. l. c.* p. 439.

Campanulata undulata, *Linn. fil. Suppl.* p. 142; *Thunb. Prodr. Flor. Cap.* p. 39; *Flor. Cap., Ed. Schult.* p. 173.

C. glabrata, *Herb. Banks. ex A.DC. l. c.*

Mr. Watson, the Assistant-Curator of the Royal Gardens, who brought seeds of this beautiful plant from near King William's Town in South Africa, in 1887, informs me that it grows in masses in marsh-lands, the stems supporting one another, and the whole forming a beautiful picture, suggestive of a group of Campanulas. The species appears to be a widely diffused one in South Africa, extending from the Transvaal westwards to the Orange Free State, and southward to Plettenburg Bay. In the Natal mountains it ascends to six thousand feet (Sutherland). It is described by Sonder as a rigid annual, but Mr. Watson found that it had a tuberous rootstock. From its habit it is well adapted for pot culture as a hanging plant; the branches descending on all sides, with ascending tips loaded with bright blue flowers. The specimen figured flowered in a cool house of the Royal Gardens in June,

1890, having been raised from Mr. Watson's seeds in 1887.

DESCR. *Rootstock* tuberous, woody. *Stems* very many, one to two feet long, slender, branched above, leafy below, decumbent and ascending, glabrous or sparingly setose. *Leaves* spreading, sessile, undulate, one to two inches long, linear-oblong, acute, base semi-amplexicaul, dark green with a ciliate cartilaginous margin, and a few bristles on the surface. *Flower* on long slender curved terminal branches, very variable; size one-half to one inch long, violet blue. *Calyx* obconical, striate, lobes subulate-lanceolate, green, glabrous or ciliate towards the base. *Corolla* narrowly campanulate, tube about twice as long as the calyx-lobes; lobes ovate, acuminate. *Filaments* filiform above, base greatly and suddenly dilated into a large obovate or obcordate lamina with recurved ciliate margins; anthers linear-oblong. *Style* hardly longer than the stamens; stigma stout, recurved. *Capsule* obconic, a fourth to one-half an inch long, ten-nerved.—*J. D. H.*

Fig. 1, Top of ovary, with stamens and style; 2, stamen :—*both enlarged.*

M.S.del, J.N.Fitch, Lith.

Vincent Brooks, Day & Son, Imp

Tab. 7175.

PITCAIRNIA Roezlii.

Native of South America.

Nat. Ord. Bromeliaceæ.—Tribe Pitcairnieæ.

Genus Pitcairnia, *L'Herit.*; (*Benth. et Hook. f. Gen. Pl.*, vol. iii. p. 665.)

Pitcairnia *Roezlii*; acaulis, foliis distincte petiolatis lanceolatis chartaceis integris facie viridibus dorso tenuiter albido-lepidotis, pedunculo erecto elongato, floribus splendide rubris in racemum simplicem subdensum dispositis, pedicellis ascendentibus, bracteis magnis lanceolatis, sepalis lanceolatis, petalis calyce 2–3-plo longioribus basi haud appendiculatis, genitalibus petalis subæquilongis.

P. Roezlii, *E. Morren in Belg. Hort.* vol. xxxv. (1885) p. 285, tab. 18–19; *Baker Handb. Bromel.* p. 106.

There is a large number of Pitcairnias with red flowers which resemble one another closely both in habit and characters. The present plant, which has only been introduced into cultivation within the last ten years, is one of the finest of them. It is marked by its distinctly-petioled comparatively broad leaves and long simple racemes of bright scarlet flowers, which remain in perfection for a long time. It was one of the last Bromeliads that were described and figured by the late Professor Edouard Morren. Like so many other garden plants there is some doubt as to its exact native country. Professor Morren thought that he had received it through M. Binot from the Organ Mountains, near Rio Janeiro. Our plant was sent from Caracas to Herr F. Worlie, of Hamburgh, and by him given to Dr. Goeze, of the Botanic Garden at Greifswald, in Pomerania. Dr. Goeze presented a plant to the Royal Gardens, Kew, and from this, when it flowered last autumn, our drawing was made. It has also been supposed to have been gathered in the Andes of Peru by Roezl, after whom it was named.

Descr. Acaulescent. *Leaves* about a dozen in a tuft, with a channelled petiole six or nine inches long, and an entire recurving chartaceous blade two or three feet long,

an inch broad at the middle, narrowed gradually to the petiole and acuminate apex, bright green on the face, thinly coated with whitish lepidote, scales beneath; outside rudimentary leaves without any prickles on the margin. *Peduncle* stiffly erect, nearly as long as the leaves. *Raceme* simple, erect, moderately dense, six or nine inches long; axis bright red and slightly cottony; pedicels ascending, half an inch long, bracts lanceolate-acuminate, longer than the pedicels. *Sepals* lanceolate, bright red, an inch long. *Petals* lanceolate-spathulate, more than twice as long as the calyx, not scaled at the base. *Stamens* nearly as long as the petals; anthers linear, basifixed. *Ovary* ovoid, but little immersed; style long, filiform; stigmas much twisted.—*J. G. Baker.*

Fig. 1, Scale from the back of the leaf, *enlarged;* 2, petal, *life-size;* 3 and 4, **anthers; 5, ovary; 6, stigmas,** *enlarged.*

M.S. del. J.N. Fitch, lith.

Vincent Brooks, Day & Son, Imp.

Tab. 7176.

CŒLOGYNE, Rossiana.

Native of Burma.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Cœlogyne, *Lindl.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 518.)

Cœlogyne (Eucœlogyne) *Rossiana;* pseudobulbis magnis ovoideis 8–10-sulcatis, foliis petiolatis elliptico-lanceolatis, scapo e basi pseudobulbi brevi valido decurvo dein erecto vaginis brevibus coriaceis arcte appressis imbricatis tecto, racemo brevi erecto paucifloro, bracteis lanceolatis ovaria subæquantibus caducis, sepalis anguste lanceolatis acutis petalisque linearibus obtusis albis, labello angusto hypochilo testaceo cristis 2 crenatis percurso, angulis (lobis lateralibus obscuris) rotundatis, epichilo parvo ovato revoluto, columna apice obtuse triloba.

C. Rossiana, *Reichb. f. in Gard. Chron.* 1884, vol. ii. p. 808; *Rolfe in Gard. Chron.* 1889, pt. ii. p. 650; *Veitch Man. Orchid. Cœlogyne*, p. 48; *Hook. f. Fl. Brit. Ind.* vol. v. p. 843, vi. p. 193.

When describing the Cœlogynes for the Flora of British India, I knew this plant only from the description of Reichenbach, which did not enable me to classify it under the new arrangement of the species which I gave in that work. I, however, suggested its affinity to be with *C. flaccida*, from which it differs in the remarkable decurved and then erect stout scape clothed from the base to the flowers with rigid green short obtuse closely imbricating sheaths. The erect few-fld. raceme brings it nearer to *C. lentiginosa*, also a native of Tenasserim, as does the scape sheathed throughout its length; but this latter species differs from *C. Rossiana* in the four-angled pseudobulb, pale green petals, and the large broad shortly clawed epichile of the lip, which is blotched with orange. *C. Rossiana* was introduced from Tenasserim by the Rev. C. Parish, by whom plants were sent to Kew in 1878. In 1884 Mr. Ross, of Castagnolo, near Florence, flowered plants of it procured also from Burma (probably Tenasserim); and it was named after that skilful cultivator by Dr. Reichenbach in the same year. The plant from which the accompanying drawing was made flowered in the Royal Gardens in December, 1889.

May 1st, 1891.

Descr. *Rhizome* very stout, creeping, as thick as a swan's quill, clothed with short brown sheaths. *Pseudobulbs* variable in size, when full-grown upwards of three inches long by nearly two broad, ovoid-oblong, green, deeply eight- to ten-grooved, naked except a few bristly remains of former sheaths at the base. *Leaves* two, six to ten inches long by two broad, elliptic- lanceolate, acuminate, strongly five-nerved, narrowed into a petiole two to three inches long. *Scape* from the base of the pseudobulb, very stout, decurved then ascending, densely clothed with closely imbricating short green rounded sheaths from the base to the flowers. *Raceme* two to three inches long, slender, erect, three- to four-flowered; bracts three-quarters of an inch long, lanceolate, brown, deciduous; pedicels with ovary about as long as the bracts. *Flowers* nearly two inches broad, pure white except the brown sides of the lip, and its yellow terminal lobes. *Sepals* narrowly lanceolate, acute. *Petals* as long, narrowly linear, obtuse. *Lip* narrow, side lobes very short, disk with two crenate ridges; midlobe small, ovate, revolute. *Column* three-lobed at the top; anther conical, obtuse.—*J. D. H.*

Figs. 1 and 2, Views of the lip; 3, column; 4, anther; 5, pollinia:—*all enlarged.*

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Tab. 7177.

LILIUM Henryi.

Native of Central China.

Nat. Ord. Liliaceæ.—Tribe Tulipeæ.

Genus Lilium, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 816.)

Lilium (Archelirion) *Henryi;* bulbo magno globoso, caule 2–3-pedali crebre foliato, foliis sessilibus lucidis inferioribus longis lanceolatis superioribus ovatis, bulbillis axillaribus nullis, floribus paucis laxe corymbosis, perianthii lutei segmentis lanceolatis e basi recurvatis punctis minutis rubro-brunneis decoratis et prope basin papillis coucoloribus prælitis, staminibus elongatis arcuatis, stylo arcuato staminibus breviore, fructu oblongo verticaliter 6-sulcato.

L. Henryi, *Baker in Gard. Chron.* 1888, vol. iv. p. 660; 1890, vol. viii. p. 380, *with figure*.

This fine new lily is one of the many interesting plants which have been discovered by Dr. Augustine Henry, who during the last ten years has sent home very large collections from Western China. At the present time he is engaged at Kew upon the distribution of his collections, and he has kindly furnished me with the following notes upon it.

"*Lilium Henryi* only occurs, so far as I have observed, in two situations, both near the town of Ichang in the Hupeh province. I saw no trace of it in my journeyings through the higher mountains of that province, and the portion of Szechwan bordering on it, in the year 1888.

It occurs on the grassy slopes of precipices, at an altitude of two hundred to two thousand feet above sea-level. A few specimens occur on the eastern side of the dome, a mass of conglomerate which rises to about one thousand eight hundred feet, and which lies ten miles south of Ichang. The plant is very plentiful on the right bank of the Ichang gorge, between the villages of Ping-shan-pa and Shih-pi-shan, and on the grassy slopes of the limestone cliffs inland from the last-named village, from which the path leads up to the Taout monastery named Yang-tai-kuan. It does not occur in the ravines, where *L. longiflorum* and *Brownii* are very common. It flowers in the last half of July.

June 1st, 1891.

I procured bulbs in March, 1889, which were kindly forwarded to Kew by Mr. Chas. Ford of the Hong-Kong Botanic Gardens."

It was from one of these bulbs, which flowered at Kew for the first time in August, 1889, that our drawing was made.

Descr. *Bulb* large, globose; scales oblong, fleshy, the outer two or three inches long by an inch broad. *Stem* three feet long below the inflorescence, bearing about thirty sessile leaves without any bulbillæ in their axils. Lower *leaves* lanceolate, reaching a length of six or eight inches; upper growing gradually smaller; uppermost ovate, not above an inch long. *Flowers* few, arranged in a lax corymb with long simple or forked branches. *Perianth* bright yellow, two or three inches long; segments lanceolate, reflexing when expanded from near the base, furnished with numerous minute red-brown spots and towards the base with a green keel and a few large clavate bright yellow papillæ. *Stamens* equally arcuate, nearly as long as the perianth segments; anthers linear; pollen dark orange. *Style* arcuate, shorter than the stamens. *Capsule* oblong, prominently six-sulcate.—*J. G. Baker.*

Figs. 1, Anther, front view; 2, anther, back view; 3, pistil complete:—*all enlarged.*

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Tab. 7178.

CYPRIPEDIUM Klotzschianum.

Native of British Guiana.

Nat. Ord. Orchideæ.—Tribe Cypripedieæ.

Genus Cypripedium, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 634.)

Cypripedium (Selenipedium) *Klotzschianum*; rhizomate repente, foliis pedalibus vix ½ poll. latis rigidis caricinis acuminatis carinatis glaberrimis, scapo glanduloso-hirsuto purpureo 2–3-vaginato 2–3-floro, bracteis oblongo-lanceolatis erectis appressis, ovario pubescente, sepalis pallidis roseo striatis glanduloso-pilosis, dorsali ovato-lanceolato, lateralibus in laminam cymbiformem subacutam labello subpositam confluentibus, petalis sepalis concoloribus et duplo longioribus linearibus tortis, labello viridi-flavo ovato-oblongo ore contracto, stamine sterili 3-lobo lobis lateralibus divaricatis falcatis marginibus purpureo-villosis.

C. Klotzschianum, *Reichb. f. ex Rich. Schomburgk Versuch. Faun. & Flor. Brit. Guian.* p. 1069 (1848); *in Linnæa*, vol. xxii. (1849) p. 811; *Veitch. Man. Orchid.* pt. iv. p. 63.

C. Schomburgkianum, *Klotzsch & Reichb. f. fid. Rich. Schomburgk*, "Reminiscence of British Guiana" (Adelaide, 1876), p. 59.

Selenipedium Klotzschianum, *Reichb. f. Xen. Orchid.* vol. i. p. 3.

C. Klotzschianum was discovered in British Guiana during the late Sir Robt. Schomburgk's second exploring expedition into that country, when accompanied by his brother Richard, late Director of the Adelaide Botanical Gardens, the news of whose lamented death has only this month reached England. Richard Schomburgk was attached to his brother's party as a naturalist in behalf of the Prussian Government, and admirably he performed his duties as such, to the great enrichment of the botanical museums of Europe. In his charming "Botanical Reminiscences of British Guiana," printed thirty years after the event, and published in Adelaide in 1876, at p. 59, when describing the magnificent scenery of the falls of the River Rue, Schomburgk, dwelling on the luxuriance of the mosses and ferns, goes on to say, "Even the crevices of the slippery masses of jasper were not without living vestments of small luxuriant vegetating ferns and Jungermannias, which in more or less dense turf-like masses adhered to the red

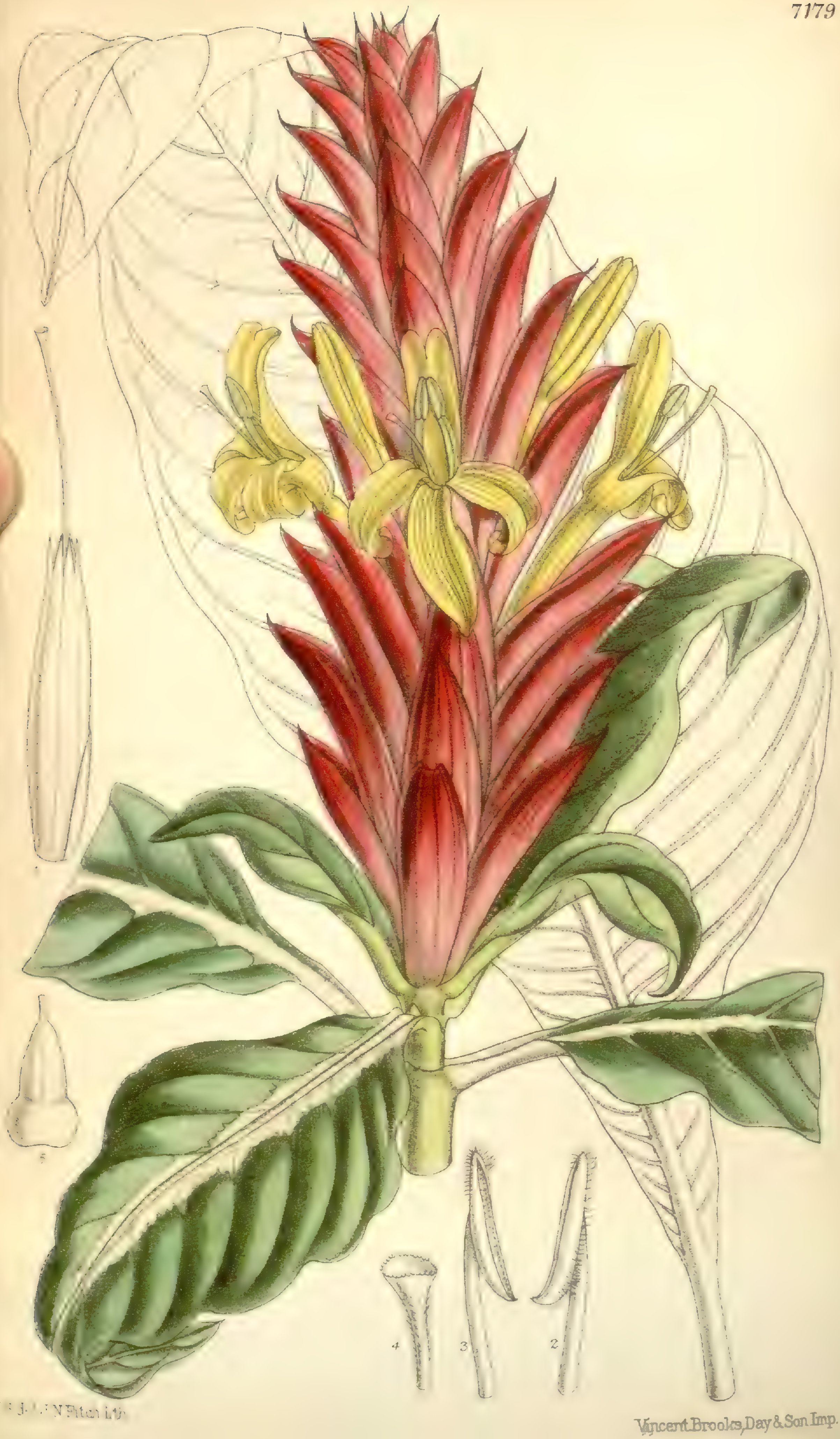
wall. *Cypripedium Schomburgkianum* (Klotzsch and Reichb.), and the pretty *Angelonia salicariafolia*, Humb. and Bonpl., had taken their places in the crevices. The vegetation of both sides of the banks consisted of *Qualea rosea*, Aubl., *Kielmeyera angustifolia*, Pohl., *Gomphia* and *Vochysia*, white flowering species of *Psidium* and *Laurus*, above which rose proud slender palms, gracefully moved by the pressure of the air from the falling waters."

It will be observed that the original intention was to have named this elegant species after Schomburgk, with Klotzsch's and Reichenbach's names as joint authorities, and the latter author seems to have overlooked this in calling it after his collaborateur. The plant has been collected by Mr. Im. Thurn during his celebrated ascent of Roraima in 1885, and living plants were imported into England by Messrs. Sander and Co. in the following year.

With regard to the affinities of this species, Veitch says in the manual, that "though when not in flower it is scarcely distinguishable from *C. caricinum*, the nearest affinity of the species is undoubtedly with *C. Lindleyanum*," a species also discovered by Schomburgk and in the same region. The broad leaves, two to two and a half inches, much larger flowers, reticulate lip, and quadrate staminode, at once distinguish *Lindleyanum* from *Klotzschianum*. In conformity with Veitch's manual I have retained the species under the old genus Cypripedium, though its undoubtedly three-celled ovary technically places it in *Selenipedium*, having no hesitation in considering that the latter genus shoud be referred to the former as a section.

The specimen figured flowered in the Royal Gardens, Kew, in October of last year; it was obtained in 1889 from Messrs. F. Sander & Co. of St. Albans.—*J. D. H.*

Fig. 1, Staminode, *enlarged*.



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Tab. 7179.

APHELANDRA Blanchetiana.

Native of Brazil.

Nat. Ord. Acanthaceæ. Tribe Justicieæ.

Genus Aphelandra, *Br.* (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 1103).

Aphelandra (Strobilorhachis) *Blanchetiana*; glaberrima, caule crasso elato, foliis ovatis acutis basi in petiolum angustatis multinerviis, spica sessili, bracteis 1½-pollicaribus erecto-patentibus lineari-oblongis mucronatis supra medium sanguineis, bracteolis parvis setaceis, sepalis scariosis æquilongis dorsali lineari subacuto, lateralibus lineari-lanceolatis acuminatis quam anticis subduplo latioribus, corollæ aureæ tubo sepalis æquilongo lente curvo bracteis breviore, fauce brevi inflata, labio superiore erecto subrecurvo oblongo obtuse 2-lobo, inferioris æquilongi lobis linearioblongis obtusis revolutis lateralibus angustioribus, antheris exsertis laxe lanuginosis, stylo exserto, stigmate parvo infundibulare ore integro ciliolato.

A. amœna, *Bull. Cat. New &c. Plants*, 1888, p. 7.

Strobilorhachis Blanchetiana, *Nees in Mart. Fl. Brasil.* vol. ix. p. 89.

From a comparison of Mr. Bull's plant with a specimen in the Kew Herbarium of *Strobilorhachis Blanchetiana* of Nees, so named by that author himself, I think there can be no doubt of their identity, though there is a difference in the number and closeness of the nerves of the leaf, these being more numerous and stronger in the cultivated plant. The leaves are the same in size and form, are similarly variegated and are narrowed below into a winged base or petiole. In Martiu's Flora Brasiliensis, Nees describes the stem as very stout and herbaceous; this is remarkably the case in the cultivated plant, the stem of which is as thick as the forefinger, and upwards of two feet in length; the leaves are described as with twenty pairs of nerves, but there are not so many in the dried specimen, and there are more in Mr. Bull's plant, in which, too, they are more spreading. The spikes are described as three, sessile, in *A. Blanchetiana*, the median a foot long and the two lateral smaller. The bracts are identical in size and shape in both, and are described by Nees as rose-coloured and the flowers as yellow.

The genus *Strobilorhachis* was established by Link,

Klotzsch and Otto in their "Icones Plantarum Rariorum," upon *A. glabra*, Nees, and *A. prismatica* (species since united by Nees himself), having long highly-coloured spikes, quadrifariously imbricating bracts, and a campanulate throat to the corolla, to which is added in De Candolle's Prodromus and Martiu's Flora, that of the stigma being compressed, funnel-shaped and two-lobed in *Strobilorhachis*, whilst it is simply two-toothed in *Aphelandra*. These characters are, however, neither clear nor constant. As will be seen in the plate here given, the stigma of *A. Blanchetiana* is funnel-shaped, but quite entire. I find this organ to vary much in this genus.

In Martiu's Flora *A. Blanchetiana* is stated to be a native of Bahia. The specimen in Kew Herbarium was collected in the province of Ilheos, by Moricand (n. 2087). Mr. Bull gives Brazil as its native country, and the name *amœna*, given when the plant was in leaf only, in allusion to the very attractive foliage, which is variegated with silver-gray on each side of the midrib and primary veins. The plant here figured, which was received from Mr. Bull, flowered in the Royal Gardens, Kew, in August of last year. —*J. D. H.*

Fig. 1, Calyx and bracteoles and style; 2 and 3, anthers; 4, stigma; 5, disk and ovary:—*all enlarged.*

Tab. 7180.

EDGEWORTHIA Gardneri.

Native of the Himalaya.

Nat. Ord. Thymelaeaceæ.—Tribe Euthymeleæ.

Genus Edgeworthia, *Meissn.*; (*Benth. et Hook. f. Gen. Pl.*, vol. v. p. 194.)

Edgworthia *Gardneri*: frutex ramosus subsericeo-villosus, foliis 3 5-polli-caribus ellipticis v. elliptico-lanceolatis acutis v. acuminatis supra glabris subtus sericeis, petiolo $\frac{1}{4}$–$\frac{1}{3}$ poll. longo, floribus in capitula globosa, sessilia v. breviter pedunculata congestis sessilibus aureis suaveolentibus, bracteis brevibus linearibus, perianthii tubo $\frac{1}{2}$ $\frac{3}{4}$ poll. longo, sericeo-villoso, lobis 4 tubo multo brevioribus late ovatis rotundatisve intus glaberrimis, filamentis brevibus, antheris oblongis, ovario apice villoso, stylo villoso.

E. Gardneri, *Meissn. in Denkschr. Regensb. Bot. Geselsch.* vol. iii. p. 380, t. 6; *in DC. Prodr.* v. xiv. pt. ii. p. 543; *Hook. f. Fl. Brit. Ind.* vol. v. p. 195.

E. chrysantha, *Lindl. in Journ. Hort. Soc.* vol. i. (1846) p. 148; *Bot. Reg.* 1847, t. 48; *Meissn. in DC. l. c.*; *Fl. des Serres*, t. 289; *Gamble Man. Ind. Timb.* p. 314; *Trees, Shrubs, &c., of Darjeeling*, p. 67.

E. papyrifera, *Zuccar. in Abhandl. Math. Phys. Kl. Bair. Acad.* v. iv. pt. 3, p. 199; *Sieb. & Zucc. Fam. Nat. Jap.* p. 694; *Miquel Prolus. Fl. Jap.* p. 299; *Franch. & Sav. Enum. Fl. Jap.* vol. i. p. 405.

Daphne Gardneri, *Wall. in As. Research.* vol. xiii. p. 388, t. 9; *Cat.* No. 1044; *Don Prodr. Fl. Nep.* 69.

D. papyrifera, *Sieb. in Act. Batav.* vol. xii. p. 24.

The earliest account of this plant in any European work (for it has been long known to the Japanese) is Wallich's excellent description and figure of it in the Asiatic Society's Researches, where it is stated to be a native of Nepal, and where it occurs wild, and is also cultivated for its beauty and perfume, and for the value of the bark, from which the finest kind of "Nepal paper" is prepared. It is singular that Wallich's account of it should have escaped the notice of Royle, whose "Illustrations of the Flora of the Himalaya," which is a veritable microcosm of the useful plants of India, contains no allusion to *Daphne Gardneri*; nor is it included in Drury's "Useful Plants," another comprehensive work on the economic plants of India, which has gone through two editions. This is no doubt partly to be accounted for by the fact that the common sort of so-called "Nepal paper" is made from another species of

Daphne (*D. cannabina*, Wall., *D. papyracea*, Meissn.) of wider distribution in the Himalayas, and which extends into the British provinces west of Nepal, where the *Edgeworthia* does not exist. Both plants are indeed found in Nepal, but the latter alone yields the material for the finest paper. Nor is its use confined to Nepal, the *Edgeworthia* extends eastwards into China and Japan, in both of which countries its value as a paper-making material is well known. Lindley figured it in 1847 from a plant sent by Fortune from Chusan to the Horticultural Society, but he makes no allusion to its uses. Franchet and Savatier, on the other hand, who include it in their Enumeration of Japan Plants, say that it is wild in Nippon, but most commonly to be found cultivated for making the best kind of paper.

The genus *Edgeworthia* contains but one species, and differs from *Daphne* only in the slight characters of a longer style and stigma. It commemorates the botanical labours of a distinguished member of the India Civil Service, the late M. P. Edgeworth, F.L.S., youngest brother of Maria Edgeworth. The specific name was given in honour of the Honourable Edward Gardner, Political Resident in Nepal, a valuable correspondent of the Calcutta Botanic Gardens, who first drew attention to the *Edgeworthia* as furnishing a paper-making material of the best quality.

The specimen here figured is from a very young plant, raised from seed sent early in 1887 by Mr. Gammie, manager of the Government Cinchona Plantations, Darjeeling, and which produced plants that flowered in the present year. When full grown it makes a very handsome greenhouse shrub. I remember a specimen at Kew some thirty years ago that formed a round ball several feet in diameter covered with leaves and balls of sweet-scented golden flowers.—*J. D. H.*

Fig. 1, Perianth laid open; 2 and 3, anthers; 4, ovary; 5, vertical section of ditto:—*all enlarged.*

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Tab. 7181.

COLCHICUM Sibthorpii.

Native of Greece.

Nat. Ord. Liliaceæ.—Tribe Colchiceæ.

Genus Colchicum, *Linn.*; (*Benth. & Hook.f. Gen. Pl.* vol. iii. p. 821.)

Colchicum *Sibthorpii*; cormo ovoideo magno tunicis saturate brunneis, foliis 5–6 vernalibus suberectis lineari-oblongis obtusis planis, floribus autumnalibus, spathæ ore obliquo lilacino, perianthii tubo elongato albido, limbo campanulato segmentis oblongis obtusis distincte tessellatis, antheris magnis linearibus luteis, stigmate oblongo.

C. Sibthorpii, *Baker in Journ. Linn. Soc.* vol. xvii. p. 427.

C. latifolium, *Sibth. & Smith Fl. Græca*, t. 350, as regards the flowers only; *Boiss. Fl. Orient.* vol. v. p. 159.

This is by far the finest of all the Colchicums which are in cultivation. It inhabits the mountains of Greece and Macedonia, ascending to five thousand feet above the sea-level. It agrees with *C. variegatum* and *Parkinsoni* in its distinctly tessellated flowers, but the segments of the perianth are much broader, and the leaves, like those of *C. autumnale*, suberect, obtuse and not at all undulated. It is the plant which is figured by Sibthorp and Smith in the "Flora Græca" under the name of *C. latifolium*, but they figure the flowers only, and their description of the leaves, on which the name *latifolium* is founded, refers to the totally different non-tessellated broad-leaved *C. byzantinum* (Bot. Mag., tab. 1122). The present plant has only been introduced very lately into cultivation in this country. Our drawing was made from plants which produced flowers in the Royal Gardens, Kew, last October and leaves at the end of February. The corms were received from Herr Max Leichtlin in August, 1890, and flowered freely in the open border.

Descr. *Corm* large, ovoid; tunics chartaceous, dark brown. *Leaves* five or six, produced with the fruit in spring, linear-oblong, suberect, dull green, not at all undulated, finally a foot or more long, an inch and a half or

two inches broad above the middle, narrowed gradually to the base. *Flowers* bright mauve-lilac, one to five to a cluster, autumnal. *Spathe* lax, cylindrical, striped with green; throat oblique, tinged with lilac. *Perianth* with a stout white tube three or four inches long; limb campanulate; segments oblong, obtuse, two inches long, distinctly tessellated inside. *Stamens* more than half as long as the perianth-segments; anthers large, linear, yellow. *Styles* more or less overtopping the anthers; stigmas oblong.—*J. G. Baker.*

Fig. 1, Front view of anther; 2, back view of anther; 3, apex of style with stigma;—*all enlarged.*

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Tab. 7182.

MUSA Basjoo.

Native of the Liu-Kiu Archipelago.

Nat. Ord. Scitamineæ.—Tribe Museæ.

Genus Musa, *Linn.*; (*Benth. et Hook. f. Gen. Pl.*, vol. iii. p. 655.)

Musa *Basjoo*; caudice cylindrico elongato, foliis paucis oblongis viridibus 8–9-pedalibus petiolo crasso pedali marginibus ad basin alatis, pedunculo crasso patulo subpedali, floribus in spicam densam subcernuam aggregatis, bracteis oblongis subcoriaceis brunneis, floribus fœmineis biseriatis 12–15-nis bracteis deciduis, masculorum bracteis arcte imbricatis persistentibus, petalo ovato acuminato calyce breviter quinquedentato vix breviori, fructu oblongo-trigono.

M. Basjoo, *Sieb. & Zucc. in Verhand. Batav. Genoot.* **12** deel. (1830) p. 18 (*name only*); *Franch. & Savat. Enum. Plant. Jap.* vol. ii. p. 20 (*in note*); *So Mokou Zoussetz*, vol. iii. tab. 1; *Kurz.* in *Journ. Agric. Hort. Soc. Ind.* N.S. vol. v. p. 164.

M. japonica, *Hort. Veitch*; *Rev. Hort.* 1889, p. 491.

The present plant has entirely the habit and general characters of *Musa sapientum*, but differs from all the very numerous forms of the cultivated Plantains and Bananas, botanically, by having a petal nearly or quite as long as the spathaceous calyx, and climatically by being able to flower and fruit under a lower temperature. The plant from which our drawing and description were made flowered freely and developed its fruit to full size, but without ripening, in the large temperate house at Kew, side by side with *Musa Ensete*. In identifying it with *Musa Basjoo* I rely mainly upon the figure in the So Mokou Zoussetz, as neither Siebold and Zuccarini, nor Franchet and Savatier give a description. It is said to be a native of the Liu-Kiu Archipelago, which stretches from Japan nearly down to Formosa, and to be cultivated frequently in the south of Japan for the sake of the fibre of its leaves, like *M. textilis* in the Philippine Islands. It was introduced from Japan into cultivation in England, by Messrs. Veitch, through their collector, M. Maries. Plants of it were grown for several years in the open air in their nursery at Coombe Wood. Our

drawing was made from a plant received from Messrs. Veitch that flowered at Kew in the temperate house last summer.

A monograph of the genus *Musa* is much wanted. There is an excellent paper, by the late Dr. Sagot, in the Journal of the Society of Horticulture of France for 1887, and, Kurz began in the Journal of the Agricultural and Horticultural Society of India, for 1878, a paper which was cut short in an early stage by his death, but there is nothing of the character of a botanical monograph of later date than Horaninow's "Prodromus Monographiæ Scitamineārum," which was published in 1882, and it is now quite out of date so far as this genus is concerned.

DESCR. *Trunk* cylindrical, reaching a length of nine feet and a diameter of seven inches in the plant drawn, and producing suckers like *M. sapientum*. *Leaves* few in a tuft; blade oblong, bright green, eight or nine feet long by about two feet broad, with the two sides hanging down from the green midrib; petiole stout, a foot long, with the edges winged down to the base. *Peduncle* stout, arcuate, a foot long, very smooth, two inches in diameter; spike dense, rather drooping, a foot or a foot and half long; clusters of female flowers three or four, containing each twelve or fifteen flowers arranged in two rows, subtended by a deciduous coriaceous broad oblong brown bract eight or twelve inches long; male clusters eight or ten, their bracts persistent and much imbricated. *Calyx* whitish, spathaceous, two inches long, five-toothed at the apex. Produced *petal* ovate-acuminate, nearly or quite as long as the calyx. *Stamens* as long as the calyx. Unripe *fruit* oblong-trigonous, about three inches long by an inch in diameter. —*J. G. Baker.*

Figs. 1 and 2, Petals, life size; 3, stamen of male flower *rather enlarged*. The bract is from one of the lower clusters, drawn half its length and breadth.

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Tab. 7183.

HIBISCUS venustus.

Native of Tahiti?

Nat. Ord. Malvaceæ.—Tribe Hibisceæ.

Genus Hibiscus, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 267.)

Hibiscus (Ketmia) *venustus*; fruticosus, totus cano-stellato-tomentosus, ramis robustis, foliis amplis longe petiolatis inferioribus 12–18 poll. latis orbicularibus breviter 5–7-lobis, basi profunde cordatis, pedunculis robustis, floribus amplis albis, epicalycis foliolis calyci æquilongis fere liberis ovato-oblongis subacutis patulis, calycis subinflati lobis brevibus obtusis 3-nerviis, petalis calyce triplo longioribus obovatis nervosis ciliolatis albis basi roseo suffusis, filamentis brevibus, antheris rubris, stigmatibus inclusis clavatis sanguineis, capsulis seminibusque hirsutis.

H. venustus, *Blume Bijdr.* 71.

Abelmoschus venustus, *Walp. Rep. Bot.* vol. i. p. 309.

A magnificent species, of which the native country is doubtful. It was first described by Blume from specimens cultivated in Java, where it occurs with both single and double flowers, under the native name of Waru Landake. There is a specimen of it in the Kew Herbarium collected by the late Dr. Horsfield, in Java, differing in no respects from that here figured, except in that the bracts of the epicalyx are rather narrower. Its nearest ally is the common *H. mutabilis* of India and Malaya, which differs in the lobes of the epicalyx being cut into linear segments. In Walper's "Repertorium" *H. venustus* is erroneously referred to the section *Abelmoschus* of *Hibiscus*, in which the calyx is spathaceous.

The specimen figured is from a plant grown by A. Kingsmill, Esq., of Harrow, an ardent horticulturalist, and a correspondent of the Royal Gardens, and is supposed to have been procured from the island of Tahiti. It flowered in January, 1879.

Descr. A large shrub, everywhere clothed with a short close pubescence of stellate hairs; branches stout, terete. *Leaves* petioled, the lower very large, reaching eighteen inches in diameter, nearly orbicular in outline, seven-lobed and deeply cordate at the base, the upper three to five-lobed; lobes in all broadly triangular, acute, irregularly

crenate; nerves five to seven, spreading from the top of the petiole, strong beneath; upper surface dark green, lower pale; petiole terete, stout, of the lower leaves six to eight inches long, of the upper shorter. *Peduncles* three to four inches long, one-fld., stout, erect or inclined. *Flowers* inclined, three inches in diameter. *Epicalyx* of five green ovate-oblong spreading segments slightly adhering at the base. *Calyx* short, rather inflated, shortly five-lobed; lobes broadly triangular, obtuse, strongly three-nerved. *Petals* one and a half inch long, broadly obovate, ciliate, strongly nerved, white or pale cream-coloured, suffused with pink at the base. *Staminal column* short; filaments about one quarter of an inch long, whitish, anthers yellow. *Style* short, with five large spathulate recurved bright-red stigmas. *Capsule* two-thirds of an inch long, hirsute. *Seeds* small, reniform, hairy.—*J. D. H.*

Fig. 1, Portion of leaf, showing the under surface; 2, stamen; 3, ovary; 4, transverse section of ditto:—*all enlarged.*

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Tab. 7184.

SYNADENIUM arborescens.

Native of Natal.

Nat. Ord. Euphobiaceæ.—Tribe Euphorbieæ.

Genus Synadenium, *Boiss.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 261.)

Synadenium *arborescens;* fruticosum, caule ramisque crassis foliis subsessilibus cuneato-obovatis subacutis v. apiculatis obscure crenulatis supra saturate viridibus lucidis nervis reticulatis subtus pallidis, cymis foliis brevioribus, involucris breviter pedicellatis 2-bracteatis, bracteis quadratis involucrum æquantibus pedicellisque puberulis.

S. arborescens, *Boiss. in DC. Prodr.* v. xv. pt. ii. p. 187.

Euphorbia arborescens, *E. Mey. in Drege. Docum.* p. 184 (*non Roxb.*).

E. cupularis, *Boiss. Cent. Euph.* p. 23.

I assume the subject of this plate to be the *Synadenium arborescens* of Boissier, a native of Natal, of which I have seen no authentic specimens, and which is hitherto the only described species known from that country, although it differs a little from Boissier's otherwise excellent description in the form of the bracts that enclose the involucre and other minute characters. The bracts in Boissier's plant are said to be velvety, ovate, and mucronulate; but in this they are quadrate, truncate and nearly glabrous. Further, I do not find in the Kew plant that the fem. flower is enclosed in a membranous tube, which is indeed a generic character. It must, however, be borne in mind that the analyses of the inflorescence of dried specimens of these succulents is a very hazardous operation, and I hesitate to found a species on characters of organs so minute and so liable to distortion. On the other hand, there may be more than one species of *Synadenium* in Natal. The genus extends into tropical Africa (see *S. Grantii*, t. 5633) and Madagascar.

S. arborescens has long been in cultivation at Kew, having been received from the late J. Sanderson, Esq., of Natal, to whom the Royal Gardens are indebted for many interesting and ornamental plants figured in this work. It flowered in November in the succulent house.

Descr. A glabrous succulent shrub four feet high,

with spreading terete branches; branchlets nearly as thick as the little finger, bluish-green, speckled with white, tips obtuse. *Leaves* towards the tips of the branches, three to three and a half inches long, spreading and drooping, subsessile, fleshy, cuneately obovate, apiculate, obscurely crenulate, very dark-green and shining above with spreading nerves and reticulate nervules, pale blue-green and quite smooth beneath, with a strong midrib and no visible nerves. *Cymes* in the axils of the uppermost leaves and about half their length, di- trichotomously branched; peduncle half to three-quarter inch long, as thick as a small goose-quill, dark-green, speckled with white like the branches, glabrous; pedicels one-quarter of an inch long, puberulous; bracts at the forks and base of the involucres opposite, quadrate, concave, puberulous, as long as the involucre, all pale green. *Involucre* one-quarter to one-third of an inch in diameter, yellow, formed of five membranous hyaline quadrate scales with lacerate tips, connate at the base, and seated in a fleshy hemispheric cup which is crenulate on the margin within (this cup answers to the large glands on the involucre of *Euphorbia*, which are here confluent). *Male fl.* (each of a single stipitate stamen) numerous, in five fascicles opposite the involucral scales, mixed with linear hairy lacerate bracteoles. *Fem. fl.* a stipitate trigonous pistil (often imperfect) in the centre of the involucre, with a short style swollen in the middle, and three diverging stigmas, each forked at the tip.—*J. D. H.*

Fig. 1, Branch of cyme with two bracts at the fork, and an involucre with its two bracts; 2, involucre with the cup removed; 3, vertical section of involucre showing the cup, the involucre scale, male flowers, and female flowers; 4, scale of involucre:—*all enlarged.*

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Tab. 7185.

MASDEVALLIA PLATYGLOSSA.

Native of New Grenada?

Nat. Ord. Orchideæ. Tribe Epidendreæ.

Genus Masdevallia, *Ruiz. & Pav.* (*Benth. & Hook.f. Gen. Plant.* vol. iii. p. 492).

Masdevallia (Coriaceæ) *platyglossa;* cæspitosa, foliis petiolatis oblongo- v. elliptico-lanceolatis v. oblanceolatis subacutis coriaceis dorso carinatis, petiolo basi vagina tubulosa brunnea instructo, pedunculis foliis æquilongis pendulis v. decurvis robustis 2–3-vaginatis 1–2-floris, vaginis tubulosis oblique truncatis, floribus intra bracteam tubulosam truncatam pedicellatis, perianthio alte 9-costato pallide flavo, sepalis coriaceis infra medium in tubum inflatum hemisphericum gibbosum basi subtruncatum connatis, dorsali triangulari-ovato acuminato recurvo, lateralibus paullo brevioribus, petalis columnæ æquilongis oblique quadratis late unguiculatis, labello sessili oblongo plano apice rotundato ultra medium granulato, columna apice crenata.

M. platyglossa, *Reichb.f. in Gard. Chron.* 1882, ii. 252.

The nearest ally of *M. platyglossa* is *M. coriacea*, Lindl. (*M. Bruck-mulleri* Hort.), which differs in the more slender scapes, longer apices of the sepals, and very stout petiole, and, according both to preserved specimens and to the figure given in Karsten's Flora of Columbia, in the erect scapes. The native country of *M. platyglossa* is not known, but as its nearest ally is from Bogota, it will probably prove to be New Grenada. It was first described by Reichenbach from a plant which flowered in 1882 in the rich collection of Sir Trevor Lawrence, to whom the Royal Gardens of Kew are indebted for the specimen here figured, which flowered in July, 1888.

Descr. Densely tufted. *Leaves* three to four inches long, oblong- or elliptic-lanceolate or oblanceolate, acute, coriaceous, keeled at the back, narrowed into a slender petiole one to two inches long, which is closely invested at the base by a cylindric brown truncate sheath. *Scapes* as long as the leaves or longer, one- rarely two-fld., pendulous or decurved, as thick as a crow-quill, bearing about three tubular loose sheaths a third to half an inch long, of a pale greenish-yellow colour with obliquely truncate pink

sheaths. *Bracts* like the sheaths of the scape, but broader. *Flower* shortly pedicelled, pale yellow, except the ovary which is streaked with bright red. *Perianth* about an inch long and nearly as broad; sepals coriaceous, strongly three-ribbed, united for about a third of their length into an inflated very gibbous cup with an almost truncate base; dorsal sepal triangular-ovate, acuminate, recurved, lateral rather narrower and shorter. *Petals* erect on each side of the column, and as long as the latter, linear, dilating into an obliquely tetragonal limb. *Lip* sessile, broadly oblong, nearly flat, yellow suffused with red-brown, obscurely three-nerved towards the base, tip rounded, distal third above granulate. *Column* stout, apex dilated, rounded and irregularly crenate. *Pollinia* ovoid.—*J. D. H.*

Fig. 1, Petals, lip, and column; 2, column; 3, anther; 4, pollinia:—*all enlarged.*

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Tab. 7186.

STENOGLOTTIS longifolia.

Native of Natal.

Nat. Ord. Orchideæ.—Tribe Ophrydeæ.

Genus Stenoglottis, *Lindl.*; (*Benth. & Hook.f. Gen. Pl.* vol. iii. p. 622.)

Stenoglottis *longifolia*; foliis numerosis ensiformibus acuminatis marginibus undulatis concoloribus, v. nigromaculatis scapo robusto bracteis numerosis lanceolatis dorso purpureo maculatis instructo, spica multiflora, bracteis ovato-lanceolatis acuminatis recurvis herbaceis ovario brevioribus, sepalis late ovatis obtusis, petalis minoribus erosis, labello lineari apicem versus trifido lobis subulatis intermedio paullo longiore lateralibus bifidis.

S. fimbriata, *Lindl.* var.; *N. E. Br. in Gard. Chron.* 1889, v. ii. p. 138.

The genus *Stenoglottis* has hitherto been represented by a single species, *S. fimbriata*, Lindl. (Tab. 5872), also a native of Natal, with much shorter oblong leaves narrowed at the base and blotched with black, a very slender scape with few erect narrow bracts, and much fewer and smaller more secund flowers, the lateral lobes of the lip of which are entire. Notwithstanding these differences, it is suggested to me by Mr. N. E. Brown, who has carefully studied the plant of both species in the Gardens, that they may prove forms of one, for disregarding the great difference in size, the principal difference between them is in the form of the leaves. Mr. Watson, on the other hand, who has both species under cultivation, at Kew, informs me that they keep quite distinct. In the Genera Plantarum (vol. iii. p. 622), and in the Journal of the Linnæan Society (vol. xviii. p. 533), *Stenoglottis* is regarded by Bentham as being perhaps too nearly allied to *Herminium*, assuming that the glands of the pollinia are naked as in that genus; but in both *S. fimbriata* and *longifolia*, the glands, which are very minute, appear to me to be contained in pouches formed by folds of the rostellum. If this is so, the position of the genus is not in the subtribe *Habenariæ*, but in *Ophrydeæ*. This character of the naked or pouched glands of the pollinia is often very difficult of

detection, and when examining the species of *Habenaria* for the Flora of British India, it appeared to me that in some of the minuter Indian species, the glands, which are normally naked in the genus, were really hidden under a fold of the rostellum. Except in wanting a spur, I should regard *Stenoglottis* as referable rather to *Habenaria* than to *Herminium*; but as the latter genus passes by insensible gradations into *Habenaria*, it may be a question whether, except from difference of habit, all these might not be combined.

The column and its appendages are not accurately described either by Lindley or in the "Genera Plantarum." They are very difficult of examination in dried specimens, but the analyses in Tabs. 5872 and 7186 of this work may, I think, be depended on, agreeing as they do in all essential points, though made by different artists. The column is exceedingly short, with two parallel anther cells separated at the base by a very short triangular erect rostellum. On either side of the anther is a short adnate staminode, with glandular apex, and rising from the base of the column on either side of the rostellum there project two erect styliform bodies as long as the anther itself, which I assume to be stigmatic processes, inasmuch as I find them to be sometimes covered with adherent pollen grains. Similar processes are present in many Habenarias, varying greatly in development from simple tubercles on the column to elongate clubs lying along the sides of the lip or curving round the mouth of the spur.

Stenoglottis longifolia was sent to the Royal Gardens of Kew by Mr. J. Medley Wood, Curator of the Durban Botanical Gardens, Natal, along with plants of *S. fimbriata*. It flowered in September, 1889.—*J. D. H.*

Fig. 1, Top of ovary lip and column; 2, lip; 3, side view of column showing the staminodes and stigmatic processes; 4, front view of do., with the processes spread out, showing also the rostellum; 5, pollinium and gland: *all greatly enlarged.*

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Tab. 7187.

FARADAYA splendida.

Native of Queensland.

Nat. Ord. Verbenaceæ.—Tribe Viticeæ.

Genus Faradaya, *F. Muell.*; (*Benth. & Hook. f. Gen. Pl.* vol. ii. p. 1154.)

Faradaya *splendida*; frutex glaberrimus alte scandens, foliis amplis oppositis longe petiolatis ovatis acuminatis basi 3-nerviis rotundatis v. cordatis, læte viridibus lucidis penninerviis, ima basi inter nervos glanduliferis, cymis terminalibus laxe multifloris, pedunculis bracteolatis, bracteolis minutis oppositis, calyce oblongo spathaceo valvatim 2-labiato, corollæ albæ tubo calyce duplo longiore anguste infundibulari, lobis 4 oblongis obtusis patulis, staminibus 4 filamentis corollæ limbo longioribus; antheris parvis oblongis, ovario brevi 4-lobo pubescente, stylo gracillimo apice bifido.

F. splendida, *F. Muell. Fragm.* vol. v. p. 212; *Benth. Fl. Austral.* vol. v. p. 69.

A very handsome tropical climber, dedicated by Baron von Mueller to the renowned physicist, Michael Faraday, in the following terms: "Genus exiimium ornavi nomine illustrissimi Michaelis Faraday, D.C.L., LL.D., Chemiæ in regio instituto Britanniæ Professoris Fulleriani, philosophi per orbem celebrati."

When discovered it was supposed to be monotypic, but two additional species have been since made known, one from the Fiji Islands, *F. vitiensis* (Seem. Fl. Viti, t. 44); the other from New Guinea, is described by Baron Mueller as *F. ternifolia*. The genus is closely allied to *Vitex*, differing chiefly in the spathaceous two-lobed calyx and lobed ovary. *F. splendida* was first collected at Rockingham Bay, by Mr. Dallachy, and has since been found (in 1873) much further north, in the Cape York Peninsula, by Mr. W. Hann, about thirty miles from the coast, when collecting for the Queensland Government. Mr. Hann describes the fruit as of the size, shape, and colour of a hen's egg, and containing a very acrid kernel.

F. splendida was sent to the Royal Gardens, Kew, from those of Brisbane in 1879; it now forms a climber in the Palm-House, the branches of which extend for

some distance along the gallery rail, and almost reach the top of the house, 60 ft. above the ground. It is conspicuous by its handsome bright green foliage, and copious panicles of very fragrant snow-white flowers, which first appeared in September of last year. The allied *F. papuana* of New Guinea is also in cultivation at Kew, but has not yet flowered.

Descr. A tall, perfectly glabrous climber, with bright green terete rather soft branchlets, which, as well as the petioles and branches of the cyme, are streaked or spotted with white. *Leaves* six to eighteen inches long, ovate or oblong-ovate, accuminate, bright green, reticulated beneath, penninerved and three-nerved at the rounded or cordate base, where are situated some large orbicular glands, visible on both surfaces; petiole three to six inches long, terete. *Cyme* laxly trichotomously branched, nearly a foot across; peduncles three-quarters to one inch long, with several pairs of minute bracts distant from the flower. *Flowers* jointed on the peduncles, very shortly pedicelled. *Calyx* an inch long, oblong, green, at length splitting into two valves. *Corolla* white, tube not twice as long as the calyx, narrowly funnel-shaped; lobes four, as long as the tube, oblong, tips rounded. *Filaments* straight, longer than the corolla-lobes, subequal, erect, slightly hairy below the middle; anthers small, yellow. *Ovary* short, broad, four-lobed, pubescent, four-celled; cells one-ovuled; style very slender, as long as the filaments, tip bifid.—*J. D. H.*

Fig. 1, Calyx in the act of splitting; 2, calyx with one-half removed, showing the ovary and style; 3 and 4 anthers; 5, ovary and pedicel; 6, transverse section of ovary:—*all enlarged.*

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Tab. 7188.

CYPRIPEDIUM CALIFORNICUM.

Native of California.

Nat. Ord. Orchideæ. Tribe Cypripedieæ.

Genus Cypripedium, *Linn.* (*Benth. & Hook.f. Gen. Plant.* vol. iii. p. 634).

Cypripedium (Foliosæ) *californicum;* glanduloso-pubernlum, pluriflorum, foliis ovato-oblongis lanceolatisve acutis multinerviis, bracteis foliaceis flores multo longioribus, sepalo dorsali erecto elliptico subacuto, lateralibus connatis labello subpositis, petalis sepalis æquilongis lineari-oblongis subacutis, labello obovoideo globoso intus basi piloso, staminodio subsessili reniformi, stigmate parvo quadrato, capsulis reflexis.

C. californicum, *A. Gray in Proc. Amer. Acad.* vol. vii. p. 389; *S. Wats. Bot. Calif.* vol. ii. p. 138.

The plicate-leaved *Cypripedia* are confined to the north temperate regions, and are for the most part natives of North America, where ten species occur, eight of them on the east side of the continent, and two, both different from the eastern species, on the west side. In Europe, on the other hand, there is but one species, the British *C. Calceolus*, which extends into Asia, and is represented in the Himalaya by *C. cordigerum*, distinguished more by colour than by better characters. In the same mountain range the Asiatic *C. macranthon* appears, which extends into Northern Asia and Japan. Of other plaited-leaved species two differ from their congeners in having two opposite leaves on the stem; they are *C. elegans*, Reichb. f. of the Sikkim Himalaya, and the fan-leaved *C. japonicum*, which is, from the singularity of the foliage, of all the most desirable to have in cultivation.

Of the North American species *C. californicum* is nearest in habit to *C. passerinum*, Richardson, a plant known to me only from specimens collected in latitude fifty-eight degrees North by Sir John Richardson, when accompanying Sir John Franklin's expedition to the Polar Sea more than half a century ago. In size and form of flower, foliage, &c., *C. passerinum* and *californicum* are identical, but the

first named is single-flowered and has a very different and oblong staminode.

C. californicum is confined to the northern parts of the state of California, where it inhabits damp woods and open swamps, growing with *Darlingtonia* in the valley of the Sacramento river. The only other Californian species, the sweet-scented *C. montanum*, Dougl. (*C. occidentale*, Wats.), has not been introduced into Europe.

For the specimen of *C. californicum*, here figured, I am indebted to W. E. Gumbleton, Esq., of Belgrove, Co. Cork, with whom it flowered in May of last year.

Descr. Glandular-puberulous. *Stem* one to two feet, leafy throughout. *Leaves* three to four inches long, from broadly ovate to lanceolate, acute, many-nerved. *Flowers* in the axils of large leafy bracts, one to one and a quarter inches across the petals, sessile; ovary decurved. *Sepals* pale brownish yellow; dorsal erect, elliptic, subacute, five-ribbed; lateral completely united into an entire boat-shaped acute limb under the lip. *Petals* as long as the sepals, spreading, linear-oblong, obtuse, dull yellow. *Lip* rather longer than the sepals, obovoidly globose, hairy at the base within, white with a little pink on the inverted lips and obscurely spotted with pale brown. *Staminode* subsessile, broader than long, reniformly obcordate, rather longer than the small quadrate stigma. *Capsule* two-thirds of an inch long, oblong, reflexed.—*J. D. H.*

Fig. 1, Top of ovary, column, and section of lip; 2, column seen in front; 3, front, and 4, back view of stamen:—*all enlarged.*

M.S.del, J.N.Fitch lith.

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Tab. 7189.

PLEUROTHALLIS IMMERSA.

Native of New Grenada.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Pleurothallis, *R. Br.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 488.)

Pleurothallis (Elongatæ) *immersa*; caudice repente, caulibus brevibus vaginatis, foliis oblanceolatis subacutis breviter petiolatis, scapo solitario gracili folio longiore basi sulco medio folii abscondito, vaginis paucis brevibus appressis acutis, racemo elongato nutante multifloro, floribus secundis pendulis fusco-purpureis, bracteis parvis lanceolatis, sepalis rectis lineari-oblongis dorso alte carinatis intus pubescentibus, lateralibus in laminam dorsali æquilongam sed paullo latiorem apice bidentatam coalitis, petalis parvis columnæ æquilongis spadellæformibus obtusis, labello oblongo obtuso recurvo granulato, carinis 2 crassis lævibus percurso.

P. immersa, *Lindl. et Reichb. f. in Bonplandia*, vol. iii. p. 223; *in Walp. Ann. Bot.* vol. vi. p. 177; *Lindl. Fol. Orchid. Pleurothall.* p. 38, *n.* 236; *Rolfe in Gard. Chron.* 1889, vol. i. p. 74.

The division of the immense genus *Pleurothallis* (it contains upwards of 350 species) into natural groups characterized by limitable characters presents great difficulties, and the labours of Lindley, Reichenbach, and Bentham in this direction are not harmonious. Thus Reichenbach, in Walper's Annals, refers *P. immersa* to a group of which the type is *Pl. chamensis*, but as he has some thirty or forty of such types, and gives no characters for his types, nothing definite is gained thereby. He further says that *P. immersa* is allied to *P. bicarinata*, a species that nowhere appears in his enumeration; it is however figured in this work (t. 4142) and shows no very close affinity with *P. immersa*, except in that the sepals are keeled at the back. Lindley in his "Folia Orchidacea," places *P. immersa* in the group *Apodæ Cæspitosæ*, with which as that group is defined by both himself and Bentham it appears to me to be altogether at variance; the *Apodæ* being minute tufted species of altogether different habit. According to Bentham's grouping of the species (in Gen. Plant.) it falls naturally into his first division of *Elongatæ floribundæ*, having an elongate many-

fld. raceme longer than the leaves and secund flowers, wherein is included *P. bicarinata*.

P. immersa is a native of New Grenada, where it was discovered by Linden. Its name is derived from the character of the lower part of the scape being firmly wedged into the central furrow towards the base of the leaf and being thus completely concealed. The specimen figured was contributed from the rich orchid collection of the Glasnevin Gardens, and flowered in the Royal Gardens, Kew, in March of last year.

Descr. *Rootstock* shortly creeping, sending up short single-leaved stems about an inch high, that are clothed with two acute brown sheaths. *Leaves* three to six inches long, oblanceolate, acute, tapering into a short petiole, deeply grooved down the centre. *Scape* longer than the leaf, green, very slender, its base tightly gripped for over two inches by the base of the leaf; sheaths of scape few, short, appressed, acute, brown. *Raceme* four to six inches long, drooping, many-fld.; bracts small, tubular, acute, shorter than the pedicels. *Flowers* pendulous (from the decurved ovary and pedicel) two-thirds of an inch long, brown-purple, two-lipped, pubescent within; lips straight, oblong, upper (dorsal sepal) acute, strongly keeled, lower (of the two lateral sepals) as long, bifid at the tip. *Petals* one-fourth the length of the sepals, paddle-shaped, as long as the column. *Lip* recurved, oblong, obtuse, granulate on the surface with two elevated longitudinal smooth ridges. *Column* with a mucronate tip as long as the petals and lip.—*J. D. H.*

Fig. 1 and 2, Flowers; 3, do. with sepals removed; 4, column and lip; 5, lip; 6, anther; 7, pollinia:—*all enlarged*.

M S del, J.N Fitch, lith

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Tab. 7190.

SYNANTHERIAS sylvatica.

Native of India.

Nat. Ord. Aroideæ.—Tribe Pythonieæ.

Genus Synantherias, *Schott.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 972.)

Synantherias *sylvatica;* folio longe petiolato pedatisecto, segmentis lateralibus dichotomis intermedioque irregularite sectis pinnatifidis v. bipinnatifidis, laciniis ultimis lanceolatis lineari-lanceolatisve, pedunculo gracili striato, spatha brevi cylindraceo-campanulata oblique hiante acuta v. apiculata fusco-viridi irrorato-maculata, spadice breviter stipitata, infl. mascula cylindracea exserta, staminibus sparsis v. varie aggregatis, feminea brevi inclusa, ovariis globosis 2–3-locularibus, organis neutris uniseriatis oblongis depressis rugosis, appendice caudiformi valde elongato pallide brunneo, basi paullo incrassato.

S. sylvatica, *Schott Gen. Aroid.* t. 28; *Prodr. Syst. Aroid.* p. 176; *Engler Monog. Arac.* p. 320.

Brachyspatha sylvatica, *Schott Synops. Aroid.* p. 35; *Engler l.c.* 314.

B. zeylanica, *Schott Syn. Aroid.* p. 36.

Amorphophallus zeylanicus, *Blume Rumph.* vol. i. p. 148; *Thwaites Enum.* p. 335.

A. sylvaticus, *Kunth. Enum.* vol. iii. p. 34; *Dalz. & Gibs. Bomb. Fl.* p. 259.

Arum sylvaticum, *Roxb. Fl. Ind.* vol. iii. p. 511; *Wight Ic. Pl. Ind. Or.* t. 802.

Arum polyphyllum, &c., *Herman Hort. Lugd. Bat.* 60.

Arum foliis palmatis, &c., *Van Royen Hort. Lugd. Bat.* vii. p. 2.

Dracunculus zeylanicus polyphyllus β, *Linn. F. Zeylan.* p. 198 et 422.

Dracontium caule immaculato, &c., *Hermann Parad. Batav.* p. 88.

After a careful comparison of the specimen in the Kew Herbarium with the description and drawings of Roxburgh, Schott, Engler, and the plant here drawn, I am convinced that all refer to the same plant. Disregarding the descriptions of the authors of the last century (which I have extracted from Blume), it is first and excellently described and figured by Roxburgh in the collection of drawings which he had made in India (now at Kew), and the figure is copied in "Wight's Icones." In it the so-called neuter flowers are each represented in their positions between the male and female inflorescences, and are described as smooth irregular glandular bodies. It is the presence of these which dis-

tinguishes *Synantherias* from *Amorphophallus;* and it was owing to their being overlooked, or disregarded, that led to the plant being placed in the latter genus by Blume. In one respect only the specimen here figured differs from *Synantherias* (as also from *Amorphophallus*) and that is in the anthers not being collected round a disk, but scattered irregularly over the surface of the spadix. This, however, is in accord with Roxburgh's drawing and description, which are the authorities for *Synantherias;* the fact being that the character is a very unstable one, the anthers being only partially aggregate in Ceylon specimens, and densely so in Bombay ones.

Whether *Synantherias* should be retained as a distinct genus, or be referred to the section *Brachyspatha* of *Amorphophallus* (with which it agrees in all other characters except the presence of neuter organs), or form a separate section of the latter genus, is a doubtful matter. It is very closely allied to the Javanese *A.* (*Brachyspatha*) *variabilis,* Blume, and until more is known of its immediate allies, it may remain where Schott and Engler have left it.

S. sylvatica is probably widely spread in the Deccan Peninsula; Roxburgh had it brought to him at Samulkote, where he cultivated it, from the mountains of the Circars; Dalzell and Gibson state that it is common in the Southern Concan, and there are specimens in Kew Herbarium from Bombay and Malabar. According to a note of Schott's in Engler's Araceæ *Am. zeylanicus* is a native of Java as well as India. In Ceylon it was discovered in the middle of the last century.

The plant here figured was sent from the Botanical Gardens, Ceylon, to those of Kew in 1886, where it flowered in a stove in May 1890, and sent up a leaf in October of the same year.—*J. D. H.*

Fig. 1, Portion of spadix with male, female, and neuter flowers; 2, stamen; 3, ovary; 4, vertical section of ditto:—*all enlarged.*

M S.del. J.N.Fitch.lith

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Tab. 7191.

REHMANNIA (Trianophora) RUPESTRIS.

Native of China.

Nat. Ord. Scrophularineæ.—Tribe Digitaleæ.

Genus Rehmannia, *Libosch.*; (*Benth. et Hook. f. Gen. Pl.*, vol. ii. p. 960.)

Rehmannia (Trianophora) *rupestris*; tota albo-lanuginosa v. glabrata, caulibus ramosis ramisque crassiusculis pendulis, foliis orbiculari-ovatis obtusis grossis crenatis nervis subtus crassis, floribus in axillis solitariis sessilibus v. in ramos subracemosis, bracteolis 2 linearibus, calycis cylindracei alte 10-costati lobis brevissimis erectis 3-fidis, corollæ laxe glanduloso-pilosæ tubo elongato lente curvo calyce triplo longiore, lobis tubo multo brevioribus rotundatis, ovario 2-loculari, capsula (placentis septicide solutis) 1-loculari, seminibus minimis.

R. rupestris, *Helmsl. in Journ. Linn. Soc.* vol. xxvi. p. 195.

Mr. Hemsley in describing this remarkable plant observes that it differs essentially from all the other species of the genus in the thick usually woolly leaves on long petioles, and in the multifid calyx. Hitherto one species of the genus alone had been in cultivation, *R. glutinosa*, Libosch (*R. chinensis*, tab. 3653), a reference to the plate of which shows how widely different these two are in these and other respects. The genus is now known to consist of six or seven species, natives of China, Formosa, and Japan. Its systematic position was considered uncertain, whether referable to *Cyrtandraceæ* or *Scrophularineæ* according as whether the ovary is one-celled with parietal placentation, or two-celled with the placentas on the septum. Judging from the placentation of *R. rupestris* and that of *R. angulata*, Hemsl. (*R. glutinosa*, var. *angulata*, Oliv. in Hook. Ic. Plant t. 1589), the placentæ appear to meet in the axis of the young ovary and be there united, but to separate afterwards; and as the habit, æstivation of the corolla, and other characters of the genus ally it to the tribe *Digitaleæ* of *Scrophularineæ*, its position in the latter order has been, no doubt rightly, generally conceded.

R. rupestris was discovered by Mr. A. Henry in the province of Hupeh, growing only in almost inaccessible

places, on the face of mountain cliffs. It bears the Chinese name of Ai-pai-ts'ai, or Cliff Cabbage, and is much esteemed as a medical simple. Mr. Henry in his notes states that the flowers are rose-coloured, when it may be assumed that they vary in colour, as they are decidedly pale cowslip yellow as grown at Kew, with a faint pinkish flush on the back of the corolla tube, and the throat is dotted with red on each side within.

I may suggest *Trianophora* (a Greek name for Neptune's Trident), as a sectional name for this plant, in allusion to the trifid calyx teeth, deferring the question of its forming a genus distinct from *Rehmannia* until the genus is more fully represented, as it will doubtless be by additions from unexplored China.

The plant here figured was raised from seed taken from a specimen collected by Dr. Henry. It flowered in a cool greenhouse of the Royal Gardens in August, 1888, and died after flowering.—*J. D. H.*

Fig. 1, Flower viewed dorsally; 2, calyx and style; 3, portion of corolla with stamens; 4 and 5, anthers; 6, ovary; 7, sketch of the whole plant reduced; *all but fig.* 1 *enlarged.*

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Tab. 7192.

HERITIERA macrophylla.

Native of the East Indies.

Nat. Ord. Sterculiaceæ.—Tribe Sterculieæ.

Genus Heritiera, *Ait.*; (*Benth. et Hook. f. Gen. Plant.*, vol. i. p. 219.)

Heritiera *macrophylla;* arborea, ramulis foliis subtus petiolisque argenteo-lepidotis, foliis amplis longe petiolatis oblongis v. oblongo-lanceolatis acuminatis penninerviis basi cuneatis v. rotundatis 3-nerviis paniculis foliis brevioribus pubescentibus, calycis urceolato-campanulati 5–7-lobi lobis acutis, fructibus oblique subglobosis rostratis, rostro compresso uncinato.

H. macrophylla, *Wall. ex Voigt Hort. Suburb. Calcutt.* (1845), 103; *Kurz For. Fl. Brit. Burm.* vol. i. p. 141; *in Journ. As. Soc. Beng.* vol. xlii. pt. ii. p. 61; *in Trim. Journ. Bot. N.S.* vol. iii. (1874), p. 66, t. 141, f. 7; *Pierre, Flore Forest. Cochinch.* t. 204.

Trochetia ? contracta, *Wall. Cat.* n. 1162.

Heritiera macrophylla has been long known in cultivation as the Looking-glass plant, under which name it has been widely distributed from Kew, where it forms a conspicuous feature in the Palm House, for its handsome foliage, bright green above and opaquely silvery beneath, like the silvering of the back surface of a mirror. It was, however, assumed to be a variety of the common tropical Asiatic littoral *H. littoralis*, Dryand, and as such it is included by Dr. Masters, in the Flora of British India (vol. i. p. 363), as a synonym, *H. macrophylla*, Hort., of that species. It had, however, previously (in 1845) been recorded as a species of Wallich's, by Voigt, in his "Hortus Suburbanus Calcuttensis," but without any description, which latter did not appear till 1845, when Kurz gave a fresh account of it in the "Journal of the Asiatic Society of Bengal," and almost contemporaneously in the "Forest Flora of British Burma," both published after the citation of the plant in the Flora of British India. For the synonym *Trochetia ? contracta*, Wall., I am indebted to a note under *H. littoralis* by Dr. King in the Journal of the Bengal Asiatic Society (vol. lx. pl. ii. p. 80), where that author alludes to *H. macrophylla* as very distinct from *H. littoralis*.

September 1st, 1891.

H. macrophylla is a rather large evergreen tree, a native of the forests of Eastern Bengal, Silhet, Munnepore, Chittagong, and Tenasserim. In India, unlike *H. littoralis*, it does not affect the sea coast or tidal swamps, but in Cambodia, according to Pierre, it is a coast plant and inhabits the delta of the Mekong river. It differs from the last named species in the much larger size of the longer petioled, more acuminate leaves, and especially in the fruit, which instead of being oblong, polished, and winged with a compressed rounded apex, is nearly globose, rough, and furnished with an abrupt flattened beak. The fruit, indeed, is the main character, for the leaves of both species vary extremely in size, form, and length of petiole.

H. littoralis, which forms a small tree in the tidal estuaries of India, Eastern Africa, the Malayan, Australian and Pacific Islands, was long in cultivation at Kew, having been introduced by Sir Joseph Banks in 1780. I remember it there as a stunted pot-plant, and its being discarded in favour of *H. macrophylla*, which, as mentioned above, was supposed to be a more vigorous form of the same species. In the Sunderbunds *H. littoralis*, called Sundri by the Bengalis, forms the chief arboreous vegetation, and affords a hard, tough, durable wood that sinks in water, much used for firewood, furniture, and boat-building. It has the peculiarity of sending up tough shoots like tent-pegs from the roots all round the parent plant, that render walking through a Sundri forest very trying.

I find no allusion to *H. macrophylla* in any of the Indian Forest works or reports to which I have access, though if its timber has properties approaching those of the Sundri it should, on account of the greater size of the tree, prove valuable, and its cultivation be attempted.—*J. D. H.*

Fig. 1, Portion of flowering panicle with two males and one female flower; 2, male flower; 3, stamens; 4, anther; 5, ovary; 6, a carpel cut longitudinally: —*all enlarged.*

M & del. J N Fitch lith.

Vincent Brooks, Day & Son lith.

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Tab. 7193.

TULIPA Sintenesii.

Native of Armenia.

Nat. Ord. Liliaceæ.—Tribe Tulipeæ.

Genus Tulipa, *Linn.*; (*Benth. et Hook. f. Gen. Plant.*, vol. iii. p. 818.)

Tulipa *Sintenesii;* bulbo magno globoso tunicis exterioribus intus dense strigosis, foliis 4 confertis lanceolatis ascendentibus glaucis glabris, pedunculo brevissimo stricto glabro, perianthio campanulato, segmentis contormibus oblongis acutis intus splendide rubris basi conspicue nigro maculatis, staminibus perianthio triplo brevioribus, ovario cylindrico-trigono stigmatibus parvis.

T. Sintenesii, *Baker in Gard. Chron.* 1891, vol. i. p. 330.

This new dwarf tulip belongs to the *Gesneriana* group. It comes nearest to *T. undulatifolia* (Bot. Mag. tab. 6308) and *T. Eichleri* (Bot. Mag. tab. 6191) differing from the former by its less acuminate perianth-segments and flat leaves, and from the latter by its dwarf habit and narrow perianth-segments. It was discovered by the collector after whom it is named, who has travelled extensively during the last three years in Turkish Armenia and sent home many interesting novelties, both in a living and dried state. It was collected at Schuschnass, near Erzeroum, and a stock of bulbs was sent to Herr Max Leichtlin, of Baden Baden. Our drawing was made from a plant that flowered at Kew in March, which was raised from one of the bulbs which he presented to the Royal Gardens.

Descr. *Bulb* globose, an inch in diameter; outer tunics brown, membranous, very hairy inside, but the hairs not at all loose and woolly, as in *T. montana*. *Leaves* four, crowded, lanceolate, ascending, glaucous, glabrous, the outer half a foot long, an inch broad. *Peduncle* very short, stiffly erect, glabrous. *Perianth* campanulate, two inches long; segments nearly uniform in shape, oblong, acute, dull pale glaucous red outside, bright scarlet inside, with a large black blotch on the claw, with an obscure yellow

border. *Stamens* one-third the length of the perianth; filaments short, black, glabrous at the base; anthers linear. *Ovary* cylindrical-trigonous, as long as the stamens; stigmas very small.—*J. G. Baker.*

Figs. 1 and 2, stamens; 3, ovary :—*all enlarged.*

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M S del J N Brooks

Vincent Brooks, Day & Son, Lith

Tab. 7194.

CITRUS AURANTIUM, *var.* Bergamia.

The Bergamot Orange.

Nat. Ord. Rutaceæ. Tribe Aurantieæ.

Genus Citrus, *Linn.* (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 305).

Citrus *Aurantium*, var. *Bergamia;* arborea, laxe ramosa, ramulis sæpius inermibus, summis angulatis viridibus, foliis ovato-oblongis acutis integerrimis, petiolo simplici v. anguste alato, floribus inter minoribus albis, fructibus majusculis globosis v. pyriformibus pallide aurantiacis, glandulis minutis depressis, carne pallida acidula, cellulis valde elongatis.

C. Aurantium, *var.* Bergamia, *Wight & Arn. Prodr. Flor. Penins. Ind. Or.* p. 98; *Brandis For. Fl. N.W. & Cent. Ind.* pp. 52, 572; *Hook. f. Fl. Brit. Ind.* vol. i. p. 515.

C. Limetta, *var.*, *DC. Prodr.* vol. i. p. 539.

C. Bergamia, *Risso et Poiteau Hist. Orang.* p. 111, t. 53–56; Ed. ii. p. 82; *Benth. & Trim. Med. Pl.* vol. i. t. 52; *Pereira Met. Med.* vol. ii. pt. ii. p. 2032; *Flückiger & Hanbury, Pharmacograph.* Ed. ii. p. 121.

C. Aurantium Bergamium, *Duham. Traité des Arbres*, Ed. Nov. vol. vii. p. 98, t. 26, f. 3.

C. Limomum Bergamotta, *Duham. l. c.* p. 81.

C. Limetta mela-rosa, *Duham. l. c.* p. 75, t. 35, f. 1; C. Bergamia, p. 76; C. Bergamia stellata, p. 76, t. 31, f. 1; Bergamia Peretta, p. 76, t. 24/2.

The Bergamot or Bergamotte Orange is a tolerably distinct race or variety of the common orange (*Citrus Aurantium*), though better distinguished by its properties than by botanical characters, these last being very variable. It resembles the Lemon in its large pale fruit, in the elongated cells of the flesh, and in its acidity; but the tree is very much less spiny, the young shoots are green, the petioles are only slightly, if at all, winged, and the much smaller flowers are hermaphrodite and pure white, and as well as the rhind are deliciously sweet-scented, having a very peculiar subaromatic odour. It is one of the three principal races of the orange proper (as distinguished from the lemons and limes, see plates 6745 and 6807 of this work), the others being the sweet orange, which is found truly wild in hot valleys of the Eastern Himalaya, and the Deccan Peninsula; the Bigaradia (bitter or Seville orange) which, like the sweet

orange, has larger convex surface glands of the fruit, those of the Bergamot being convex or depressed. There is no record or tradition of the origin of either the Bergamot or Bigaradia, though they may probably have been differentiated in Persia, where the passion for scents being universal, that of a variety or shoot of the orange differing so greatly in strength and quality of odour as the Bergamot does from its allies, would be sure to attract attention and lead to the propagation of the race. It has been assumed by Gallesio to be a hybrid between the sweet orange and lemon, but there are no definite grounds for the assumption.

According to Flückiger and Hanbury the Bergamot orange appeared in Europe in the latter part of the seventeenth century, and the essential oil from it is included in a list of the stores of a Giessen apothecary in 1688. The first precise notice of it is contained in a little book called "Le Parfumeur François," printed at Lyons in 1693. The author, Le Sieur Barbe, says that the oil is obtained from the fruits of a lemon tree grafted on the stem of a Bergamot pear. Risso and Poiteau, in their splendid "Histoire Naturelle du Orange" (Paris, 1818), class the Bergamot amongst the true oranges (*C. Aurantium*) and enumerate three varieties, namely—var. *torulosa*, with pyriform ribbed fruit; var. *parva*, with small globose fruit; and var. *Mellarosa*, with a rounded depressed fruit, ribbed on the sides and areolate at the top; the latter they regard as intermediate between the Bigarade and Bergamot. Loiseleur Deslongchamps, on the other hand, in the enlarged edition of Duhamel Traité des Arbres, &c. (Paris, 1808), treats of Bergamots under the three species *C. Aurantium*, *Limetta* and *Limonum*, as cited amongst the synonyms enumerated above. He gives the name "Orange Bergamotte" only to *C. Aurantium Bergamium*, and of the C. Limetta Bergamia he says that is cultivated hardly anywhere but at Nice, and there for the manufacture of the delicious bon-bons called "Bergamottes."

Oil or essence of Bergamot is the product for obtaining which the Bergamot orange is cultivated. It is used only in perfumery and confectionery, and may be extracted by distillation, or by sponging the surface of the fruit, or by a machine which crushes the surface of the skin and thus

forces the oil from the oil glands. For this purpose the fruit is gathered when still green, in November and December, and one hundred fruits are said to yield two and a half to three ounces of oil. Calabria is the country where the cultivation of the tree and manufacture of the oil is chiefly carried on, and in a less degree Sicily and the Riviera. The name Bergamot is derived from the Italian Bergamotta, a pear, and from the shape of the fruit; the Bergamotte pear itself is from the town of Bergamo, where, however, the Bergamot orange is not cultivated. For the specimen figured I am indebted to Thos. Hanbury, Esq., F.L.S., of the Palazzo Orengo, La Mortala, near Mentone, in whose splendid gardens the Bergamot fruits freely and ripens in early spring.—*J. D. H.*

Fig. 1, Fruit; 2, the same cut transversely; 3, surface gland:—*all of the natural size.*

Tab. 7195.

IMPATIENS mirabilis.

Native of Langkawi Island.

Nat. Ord. Geraniaceæ.—Tribe Balsamineæ.

Genus Impatiens, *Linn.*; (*Benth. & Hook. f. Gen. Pl.* vol. i. p. 277.)

Impatiens *mirabilis*; caule orgyali columnari crasso cylindraceo apice folioso, foliis confertis longe petiolatis amplis subcarnosis ovatis crenatis costa crassa, petiolo valido alato, racemis brevibus axillaribus erectis pauciflоris simplicibus v. basi ramosis, pedunculo valido, floribus magnis aureis, sepalis 3, lateralibus elliptico-oblongis acutis concavis, postico brevi amplo hemispherico calcare brevi incurvo, petalo antico rotundato v. transverse oblongo, petalis lateralibus in unum porrectum trilobum coalitis, lobis lateralibus rotundatis erectis concavis, intermedio angustiore oblongo plano bipartito segmentis oblongis apice rotundatis.

It would be difficult to conceive a wider departure from the habit of its genus than this remarkable plant presents. It is an undoubted *Impatiens*, but whereas the other species of that large genus are weak succulent annuals, or low branched perenials, *I. mirabilis* possesses an erect naked trunk that attains in its native country to four feet in height, and the thickness of a man's leg, crowned with a tuft of many large, long petioled, fleshy, spreading leaves, nearly a foot long, from the axils of which spring erect racemes of golden flowers, larger by far than in most other members of the genus known to me, but singularly uncouth in form.

In the absence of fruit it is not possible to determine the nearest affinity of *Impatiens mirabilis*, but it probably belongs to the section of the genus with short ellipsoid or oblong capsules turgid in the middle, to which the Malayan and Deccan Peninsular species almost exclusively belong; the other section, with linear or clavate capsules being almost exclusively Himalayan. In its very stout perennial stem it approaches the members of a little group of thick-stemmed Nilghiri species to which I applied the term "Epiphyticæ" in the Flora of British India, but these are very small prostrate plants, with usually swollen internodes, and have

flowers with the posticous saccate sepal inflated and much larger than the rest of the flower; one of them, *I. Jerdonæ*, is figured at Tab. 4739 of this work.

The specimen here figured was communicated by Messrs. Veitch in August, 1890, with the information that it came from Penang, but as there are specimens in the Kew Herbarium collected by its discoverer, Mr. C. Curtis, the Superintendent of the Penang Gardens, in the Island of Langkawi, off the east coast of Sumatra, it is probable that the latter is its native country, and that Mr. Veitch's information refers to the fact of his plant having been sent to England from Penang (no doubt by Mr. Curtis). In a note accompanying Mr. Curtis' Herbarium specimens (No. 1678), the plant is stated to form a shrub three to four feet high, with a stem as thick as a man's leg, and very brittle, and that it inhabits limestone rocks. It is not stated whether it branches or not. Messrs. Veitch's specimen was about six inches high, with a strictly columnar simple trunk, gibbous at the base, greenish on the surface, and two-thirds of an inch in diameter. Plants of it in the Royal Gardens, sent by Mr. Curtis, have also simple stems, but they vary a good deal in shape, some being dilated and turnip-shaped in the lower half. The leaves vary from ovate to oblong, and attain ten inches in length. —*J. D. H.*

Fig. 1, Sepal; 2, stamen :—*both enlarged.*

M.S.del, J.N.Fitch lith.

Vincent Brooks, Day & Son Imp

Tab. 7196.

PHALÆNOPSIS Esmeralda.

Native of Cochin China.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Phalænopsis, *Blume*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 573.)

Phalænopsis *Esmeralda*; foliis 4–8-pollicaribus oblongis acutis, pedunculo elongato suberecto, racemo 6–10 floro erecto, floribus 1–1½ poll. latis roseis albis purpureisve, sepalis lateralibus late triangulari-ovatis base late pede columnæ adnatis, dorsali spathulato obovato, petalis obovatis sepalo dorsali paullo minoribus, labello unguiculato 3-lobo, lobis lateralibus oblongis obovatis rotundatisve erectis, terminali lato obtuso, disco inter lobos laterales calloso, ungue utrinque auricula parva elongata instructa, columna crassa basi dilatata.

P. Esmeralda, *Reichb. f. in Gard. Chron.* 1874, vol. ii. p. 582; *Revue Horticol.* 1877, p. 106, 107, fig. 17–19; *Floral Mag.* 1879, t. 358; *Orchidoph.* 1881, p. 9, *cum Ic.*; *Warner & Williams, Orchid. Alb.* vol. vii. t. 321; *Rolfe in Gard. Chron.* 1886, vol. ii. p. 276; *Hook. f. Fl. Brit. Ind.* vol. vi. p. 31; *Veitch. Man. Orchid.* part vii. p. 27.

P. antennifera, *Reichb. f. in Gard. Chron.* 1879, vol. i. 398; 1882, vol. ii. 520; *Rolfe l.c.* 1886, vol. ii. p. 176.

P. Regnieriana, *Reichb. f. l. c.* 1877, vol. ii. p. 746.

P. Buissoniana, *Reichb. f. l. c.* 1888, vol. ii. p. 295.

I share the opinion expressed by Messrs. Rolfe and Veitch, that the four species cited above are really one and the same, varying a good deal in the size of the flower, and greatly in colouring, from a dark purple, as figured by Warner and Williams in their Orchid Album, to pale purple as in the plate in the Floral Magazine, and to white with red streaks in the lip as described by Mr. Rolfe in his var. *candidula*. In fact, as remarked in Veitch's Manual, "the colour variations are too numerous to admit of separate notice." Further, as observed in the same excellent work, *P. Esmeralda* differs from all other described species of Phalænopsis in several very important points, especially the erect many-flowered racemes, and the structure of the lip, which is clawed and bears no cirrhi either at the apex or on the disk, but two narrow auricles (called cirrhi by Veitch) on the very pronounced claw, one on each side, like the small supplementary lobes of *Trichoglottis*. I very much doubt indeed if these so-called cirrhi of *P.*

Esmeralda represent those of other species of the genus, but this is a morphological question requiring a comparative study of the development of the lip of *Phalænopsis* and allied genera for its satisfactory determination. They may represent the two small lateral lobes of the lip of *P. Parishii*, in which case the so-called cirrhi of the lip of *P. Esmeralda* are mere dilations of the mid-lobe. Describing the lip of *P. Esmeralda* in the Flora of British India, from dried specimens, I have said that the disk presents a two-awned callus in front of the auricles (cirrhi); in the living plant I find the callus but not the awns. With regard to the auricles they vary much in shape, straight and almost subulate in the specimen here drawn, to falcate and subpathulate in others.

P. Esmeralda was introduced from Cochin China in 1874 by M. Godefroy. It has also been found in Cambodia and in the Island of Langkawi between Sumatra and the Malayan Peninsula. It is also a reputed native of Burma. The specimen here figured was received from M. A. Regnier, of Avenue de Marigny, of Fontenay sous Bois, Seine, the importer of *P. Buissoniana* and *P. Regnieriana*; it flowered in the Royal Gardens in November, 1890.—*J. D. H.*

Fig. 1, Flower with the sepals and petals removed; 2, column and its foot; 3, anther; 4 and 5, pollinia :—*all enlarged.*

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Tab. 7197.

YUCCA FILIFERA.

Native of North-East Mexico.

Nat. Ord. Liliaceæ.—Tribe Dracæneæ.

Genus Yucca, *Linn.*; (*Benth. et Hook. f. Gen. Plant.*, vol. iii. p. 778.)

Yucca *filifera;* trunco arboreo valido ramoso, foliis ensiformibus dense rosulatis pedalibus vel sesquipedalibus filis marginalibus copiosis, floribus in paniculam angustam sæpissime pendulam dispositis, bracteis ovatis scariosis, pedicellis flore brevioribus apice articulatis, perianthii segmentis ovatis vel oblongis acutis exterioribus angustioribus, staminibus perianthio subtriplo brevioribus, filamentis clavatis arcuatis puberulis, antheris oblongis parvis, fructu oblongo baccato, seminibus crassis.

Y. filifera, *Chaband in Rev. Hortic.* 1876, p. 439, fig. 97; 1880, p. 376; 1884, p. 53; *Gard. Chron.* 1888, vol. i. p. 743, fig. 97; p. 751, fig. 100; *Sargent in Garden and Forest*, vol. i. (1888) p. 78, figs. 13–14.

Y. baccata *var.* australis, *Engelm. Monogr. Yucca*, p. 44; *Baker in Journ. Linn. Soc.* vol. xviii. p. 229.

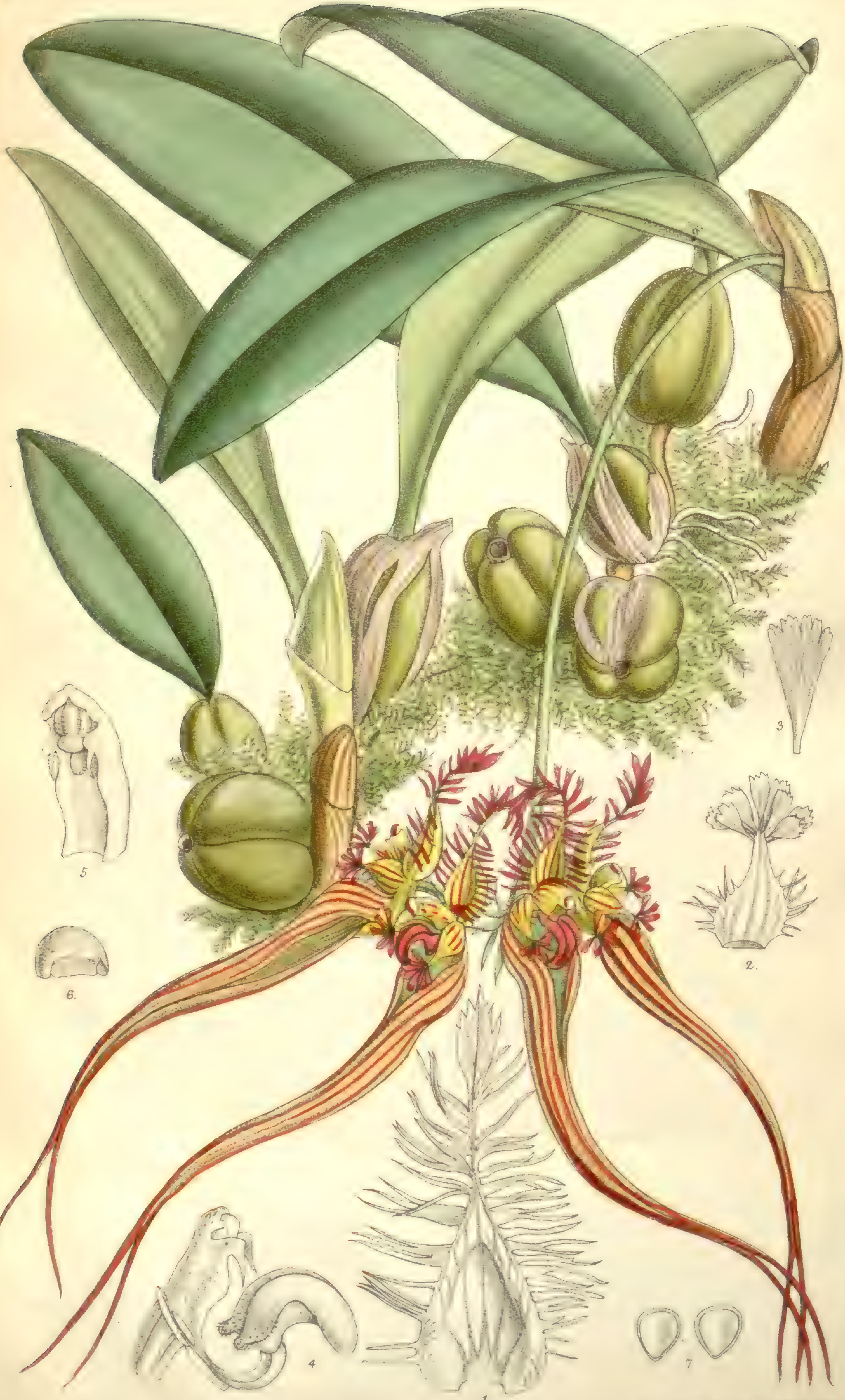
This is by far the finest of the filiferous Yuccas. The fullest account of it is contained in Professor Sargent's paper in the "Garden and Forest" for 1888 above cited. It was discovered in 1840 by Dr. Gregg near Saltillo in North-East Mexico, but was not introduced into cultivation till long afterwards. Professor Sargent writes about it as follows:—"*Yucca filifera* is a conspicuous object on the arid plains which rise from the Rio Grande to the foothills of the Sierra Madre. The great panicles of white flowers can be seen for miles in the clear atmosphere of that region, and look like gleaming waterfalls pouring out from the end of the branches. It first appears about fifty miles south of the Rio Grande, where, with the beautiful white-flowered *Cordia Boissieri* in the depression of the plain, it forms an open picturesque forest which extends almost to the valley of Monterey. The 'Palma' is common in the plains between Saltillo and Parras. It was seen by Dr. Parry as far south as San Louis Potosi, and no doubt will be found to extend widely over the high dry plains of north-eastern Mexico."

The history of the plant from which our figure was

drawn is very remarkable. The trunk was sent to Kew in October, 1888, by Mr. C. G. Pringle, from Monterey, through Professor Sargent. When it arrived at Kew it appeared to be quite dead, and the trunk was consequently placed in the Museum of Economic Botany. After remaining there two years it put out rudimentary leaves and an inflorescence, and on being transferred to the Temperate House these were fully developed in September, 1890. The leaves are shorter than in the wild type and the panicle is erect and less dense.

DESCR. *Trunk* finally arborescent and copiously branched; in our plant simple, cylindrical, fifteen feet long. *Leaves* densely rosulate, ensiform, thinner and smaller than in Y. *baccata*, a foot or a foot and a half long, with copious fine recurving threads splitting off from the margin. *Panicle* in our plant erect, but in the fully-developed wild plant drooping, four or six feet long by eighteen or twenty inches broad, very dense; pedicels articulated at the apex; bracts large, ovate, scariose. *Perianth* white, campanulate, an inch or an inch and a half long; segments ovate or oblong, acute, the three outer much narrower than the three inner. *Stamens* about a third as long as the perianth; filaments clavate, arcuate, pubescent; anthers small, oblong. *Pistil* overtopping the anthers. *Fruit* oblong, baccate, two inches or more long, pendulous, often constricted on the side towards the stem. *Seeds* black, often more than a line in thickness.—*J. G. Baker.*

Fig. 1, Stamen; 2, stamens surrounding the pistil; 3, pistil:—*all enlarged.*



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Tab. 7198.

CIRRHOPETALUM Collettii.

Native of the Shan States.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Cirrhopetalum, *Lindl.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 504.)

Cirrhopetalum *Collettii*; rhizomate robusto, pseudobulbis 4-lobis, folio elliptico- v. oblongo-lanceolato, scapo robusto deflexo 5–6 flore, bracteis subulato-lanceolatis, floribus magnis aurantiacis rubro striatis, sepalo dorsali triangulari-ovato caudato, cauda, marginibusque paleis membranaceis elongatis mobilibus creberrime onustis, sepalis lateralibus dorsali pluries longioribus in caudas gracillimas sensim angustatis, petalis ovato-rotundatis acuminatis apicibus fasciculo palearum instructis, labello breviter stipitato oblongo obtuso incrassato recurvo, columna longiuscula apicem versus utrinque arista decurva instructa.

C. Collettii, *Hemsl. in Hook. f. Fl. Brit. Ind.* vol. vi. p. 773; *in Journ. Linn. Soc.* vol. xxviii. p. 131, t. 20 (errore *Collettianum*).

Cirrhopetalum Collettii is certainly in many respects the most singular species of the genus hitherto discovered, though in so far as its peculiarities of structure are concerned, these differ only in degree of development from what obtain in species already known. Thus, as Mr. Hemsley well observes, *C. Collettii* is nearest in affinity to *C. ornatissimum* of the Eastern Himalaya, in which the petals are tipped with a bunch of slender mobile red paleæ. It is also nearly allied to *C. fimbriatum* of Bombay, figured at tab. 4391 of this work, the dorsal sepals and petals of which are margined with long slender paleæ attached, as in the plant here figured, by so minute a point as to be in constant motion. In neither of these, however, are the paleæ dilated, cuneiform and lacerate, as are the terminal and often the lateral ones of the dorsal sepal of *C. Collettii*, and in those of the bundle that tips the petals.

Mr. Hemsley has pointed out to me a peculiarity in the mode of growth of this species, in that the flowering scape is not formed at the base of a fully formed pseudobulb, but is developed together with a young leaf which afterwards forms a pseudobulb, and is enclosed in sheaths with it, as shown in the drawing. I observe the same

phenomena in *Bulbophyllum fusco-purpureum*, but not in any other species of *Bulbophyllum* or *Cirrhopetalum* that I have examined, though it no doubt may occur in others.

The flowering of this beautiful plant enables me to correct two errors that have crept into the descriptions which were made from dried specimens. One of these (in the Flora of British India) describes the pseudobulbs as very small; the other (in the Linnean Journal) figures and describes the peduncle as erect.

C. Collettii was discovered by Major-General Collett, C.B., F.L.S., in the Southern Shan hills, when on service there during the late Burmese war, and is one of a fine collection of plants, amounting to upwards of seven hundred species, of which twelve per cent. were new, made chiefly by this distinguished officer in that previously unvisited and indeed inaccessible region. These are enumerated, with descriptions of the new species, by Mr. Hemsley in the Journal of the Linnean Society cited above; and the enumeration is prefaced by a valuable essay (accompanied by a good map) on the climate and vegetation of the Shan hills, by General Collett himself. Amongst other plants the *Cirrhopetalum* is noted as highly curious, and meriting notice; the flower, which is inodorous, being "remarkable for the extremely long attenuated sepals, which are highly mobile and are wafted about by the slightest breath of air; and for the flower being also furnished with a number of little streamers or banner-like appendages, which, as Darwin remarks of an allied *Bulbophyllum* (*B. lemniscatum*, Plate 5961), when blown by a breath of wind wriggle about in a very odd manner."

Another plant discovered by General Collett is *Rosa gigantea*, Collett (Hemsley, l.c. 55, t. 9), a white-flowered species allied to *R. indica*, with flowers five inches in diameter, and which is flourishing at Kew, though it has not as yet flowered.

Live plants of *Cirrhopetalum Collettii* were sent to the Royal Gardens by its discoverer in 1888, where the plant here figured flowered in May of the present year.—*J. D. H.*

Fig. 1, Dorsal sepal; 2, petal; 3, palea from the latter; 4, column and lip; 5, column; 6, anther; 7, pollinia:—*all enlarged.*

3
4
1
2.

Tab. 7199.

NAPOLEONA Miersii.

Native of tropical West Africa.

Nat. Ord. Myrtaceæ. Tribe Lecythideæ.

Genus Napoleona, *Beauv.* (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 723).

Napoleona *Miersii*; glaberrima, foliis obovato-oblongis obtuse cuspidatis remote sinuato crenatis membranaceis basi rotundatis cuneatisve, glandulis marginalibus ad crenas distinctis, nervis utrinque 7–10 immersis, corolla orbiculari circa 40-dentata et costata extus flava costis basi roseis, intus tricolora, zona exteriore flavida, interiore rosea, intima alba, corona exteriore, e filis ad 70 albis patulis, interiore membrana suberecta alba ad medium multifida laciniis ad 40 acutis incurvis, intima (staminiea), arcte inflexa 20-fida, laciniis apice triangularibus 10 antheriferis per paria dispositis, 10 anantheris per paria interpositis.

The genus *Napoleona*, which in the structure of its flowers is one of the most curious of flowering plants, consists of about eight known species, all confined to tropical Western Africa, between Senegal and Angola. Owing to the rarity of specimens in Herbaria and under cultivation, and the imperfect description and figures given by the author of the genus of the only species known to him (*N. imperialis*, Palisot de Beauvois, "Flore d'Oware et de Benin," vol. ii. p. 30, t. 78), much difficulty has been experienced in determining the species. This has been attempted by the late Mr. Miers, F.R.S., who, in 1874, presented to the Linnean Society an elaborate and valuable paper on the genus, of which he described seven species, including that figured in this magazine as *N. imperialis* (Tab. 4387), but which, as had been previously shown, was not the plant so named by Palisot de Beauvois, but a very different one, subsequently named *N. Whitfieldii*, after its discoverer. By an oversight Miers has misrepresented the authorship and confused the synonymy of this species (*Whitfieldii*), attributing it to Lindley, and citing for it that author's description of it in the "Gardener's Chronicle," the "Botanical Register," and "Vegetable Kingdom," in all which Lindley assumed it to be *N. imperialis*. The real author of the name *N. Whitfieldii* is Lemaire, who published

it in his "Flore des Serres," Ser. i. vol. i. (1845) p. 4, in which work it was subsequently figured by Van Houtte, vol. iv. (1848) t. 386, 387, the figure being copied, without acknowledgment, from that in this Magazine. It was subsequently very badly figured in the Revue Horticole, 1853, p. 301, t. 16, with an excellent description by Decaisne, who was the first (and hitherto the only) botanist who recognized the true structure of the staminal corona, which, like that of *N. Miersii*, consists of twenty filaments in clusters of four, of which the two outer are alone antheriferous; in other words, there are ten antheriferous filaments approximate in pairs, with as many interposed anantherous, also in pairs. Lindley had described twenty antheriferous stamens, Miers correctly notes ten, but does not give their arrangement.

It remains to give the characters by which the species which I have named after my late friend, the monographer of the genus, may be distinguished from the very nearly allied species which he has described. These are *N. Whitfieldii* (which *Miersii* was supposed to be), *N. cuspidata*, and *N. Mannii*. From all of these *N. Miersii* is distinguished by the pale membranous more obovate leaves with faint sunk nerves; further from the first (see t. 4387) by the much fewer larger teeth of the corolla, the pale rose zone within the outer one, the white filaments of the outer corona, and the longer and white colour of the erect inner corona. Miers describes the teeth of the corolla of *Whitfieldii* as only forty, and the filaments of the corona as scarlet, neither of which is correct. *N. cuspidata* is described by Miers as having a purple forty-toothed corolla with a pale yellow margin, yellow filaments of the outer corona, and the twenty filaments of the staminal corona as all antheriferous (which latter, however, I did not find to be the case in the only flower which I have examined). *N. Mannii*, a Fernando Po species, appears to me to be the nearest to *N. Miersii*, but besides the difference of foliage the flowers are much smaller; it is described by Miers as having only thirty teeth to the wholly yellow corolla, and with all the filaments (twenty) antheriferous; but this latter is not the case in the flower I examined, where the ten antheriferous flaments were irregularly disposed. The examination of this species, and

comparison of it with the dried specimens of others in the Herbarium, has convinced me that much remains to be done towards determining and defining accurately the available materials of this curious genus. *N. Miersii* forms a shrub in the Palm House of the Royal Gardens. It was received from the Royal Botanical Gardens of Edinburgh in 1886, and flowered in October, 1890.—*J. D. H.*

Fig. 1, Vertical mesial section through flower; 2, portion of staminal corona; 3, stamen; 4, ovary :—*all enlarged.*

M.S. del. J.N. Fitch lith. Vincent Brooks, Day & Son Imp.

Tab. 7200.

EUCRYPHIA Billardieri var. Milligani.

Native of Tasmania.

Nat. Ord. Rosaceæ.—Tribe Quillajeæ.

Genus Eucryphia, *Cavanilles; (Benth. & Hook. f. Gen. Pl.* vol. i. p. 615.)

Eucryphia *Billardieri ;* frutex v. arbor glaberrima, foliis oppositis simplicibus breviter petiolatis oblongis lineari-oblongisve obtusis integerrimis coriaceis subtus glaucescentibus, floribus albis breviter pedunculatis.

E. Billardieri, *Spach. Hist. Nat. Veg.* vol. v. p. 344; *Hook. f. Fl. Tasman.* vol. i. p. 54; ***Benth. Fl. Austral.*** vol. ii. p. 446.

Carpodontos lucida, *Labill. Voy. Terr. Austr.* vol. ii. p. 16, t. 18; *Fl. Nov. Holl.* vol. ii. p. 122; *DC. Prodr.* vol. i. p. 556.

Var. *Milligani ;* frutescens, foliis minoribus lineari-oblongis confertis, floribus minoribus.

E. Milligani, *Hook. f. Fl. Tasman. l. c.* t. 8.

Under *E. pinnatifolia*, at Tab. 7067 of this work, I have remarked upon the various opinions that have been held as to the position in the Natural system to which this very remarkable genus should be referred, *Hypericineæ*, *Chlænaceæ*, *Saxifrageæ*, *Rosaceæ*, or *Tiliaceæ;* to which might be added with as much reason as some of the above *Ternstræmiaceæ*. The fact is that *Eucryphia* has no hitherto recognized undoubted near relatives in the vegetable kingdom, and having regard to the two most noticeable points in its history and structure, namely that it is confined to Chili and Australia, and that of the three known species two have simple and one pinnate leaves, it may well be regarded as the evidence of a vegetation different from that now existing, which flourished when there was either direct or interrupted land communication between the temperate regions of Australia and South America.

In the Flora of Tasmania I regarded var. *Milligani* as a species distinct from *E. Billardieri*, from which it differs in the much smaller size of all its parts, and shorter more obtuse leaves; it also inhabits higher elevations and never attains the stature, sometimes one hundred feet, that *E. Billardieri* does. Bentham, however, in the Australian

Flora, having examined intermediate forms, unhesitatingly unites them, no doubt rightly. For nearly a century *E. Billardieri* was the only known Australian species, and the genus was supposed to be confined to Tasmania in the Old World; but comparatively recently, since the publication of Bentham's Flora Australiensis, Sir Ferdinand Mueller has published a Continental Australian species, *E. Moorei* (Fragment. Phyt. Austral, vol. iv. p. 2), a native of New South Wales.

The plant figured was raised from seed sent in 1884 by F. Abbott, Esq., of the Botanical Gardens, Hobartown, Tasmania. It flowered for the first time in June of the present year.—*J. D. H.*

Fig. 1, Calyptriform calyx; 2 and 3, stamens; 4, ovary; 5, transverse section of the same:—*all enlarged.*

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Tab. 7201.

EPIPHYLLUM Gaertneri.

Native of Brazil.

Nat. Ord. Cacteæ.—Tribe Echinocacteæ.

Genus Epiphyllum, *Pfeiff.*; (*Benth. et Hook. f. Gen. Plant.*, vol. i. p. 850.)

Epiphyllum *Gaertneri;* internodiis 2–3 pollicaribus 1–1¼ poll. latis late truncatis crenatis crenis piliferis, passim tuberculis longe piliferis instructis, floribus terminalibus binis speciosissimis sanguineis cœruleo micantibus, calyce brevi vaginato inequaliter lobato basi pilis elongatis cincto, petalis anguste lanceolatis acuminatis patenti recurvis, staminibus numerosissimis, filamentis capillaribus, antheris minutis oblongis confertis, **stigmatibus 5 lineari-elongatis patentibus.**

Epiphyllum Russellianum, *var.* Gaertneri, *Regel Gartenflor.* v. 1844, p. 323, t. 1172; *Carrière in Rev. Hortic.* 1887, p. 516, *cum Ic. chromolith.*; *Pape in Wittmack. Gartenflor.* 1890, p. 581; *Pynaert in Rev. Hortic. Belge*, 1889, 114; *Forst. Cact.* p. 873.

E. Makoyanum, *Hort. ex Pynaert. in Rev. Hortic. Belg.* 229, *cum Ic.*; *The Garden*, 1889. p. 375; *Hamburg Garten & Blumenz.* 1889, p. 419; *Journ. of Hortic.* 1889, p. 352, *cum Ic.*; *W. Watson in Rev. Hortic. Belge, l.c.* 267; *Kew Bulletin*, 1890; *App.* ii. p. 45.

Unaccountably as it appears to me, this brilliant species was for long supposed to be a variety of *Epiphyllum Russellianum*, Hook., figured in this Magazine half a century ago (Plate 3717), a plant that has ever since been a universal favourite with all lovers of horticulture.

From *E. Russellianum*, *E. Gaertneri* differs in its much larger, broader, thicker crenulate articulations, which are broadly truncate at the top, regularly crenate on the sides, and with tufts of long hairs both in the crenatures and around the bases of the flowers; the flowers present even more important differences, in the brilliant colouring, length, and narrowness of the petals, in the almost terete (not broadly winged) calyx tubes, in the very numerous stamens with clustered minute anthers, and in the long spreading stigmas.

I have followed previous authors in retaining this plant in *Epiphyllum*, though having regard only to the technical character employed to distinguish that genus from *Phyllocactus* (the very oblique two-lipped flower of the

original *E. truncatum*), it would appear to be properly referred to the latter. I am, however, very doubtful whether the two genera can be retained; for if so, it must be on other characters than the above. In one point the three *Epiphylla* agree, and that is the terminal position of the flowers, solitary in *E. truncatum* and *Russellianum*, binate in *Gaertneri*, but whereas the first and last of these have very numerous stamens with minute clustered anthers and long slender stigmas, *E. Russellianum* has few stamens of unequal length, with long distant anthers and short stigmas. Reviewing the species of *Phyllocactus* figured in this Magazine, they all have flowers inserted in the crenatures of the articulations, but they display very great variations in the length of the calyx tube, the obliquity of the flower (but never so oblique as in *E. truncatum*, or two-lipped), the number of stamens, size and aggregation of the anthers, and in the number and length of the stigmas.

I have retained the name of *Gaertneri* for this plant, as that originally proposed, though only as a variety. *E. Makoyanum* was a mere name in Makoy's Catalogue, and was adopted by Pynaert under the impression that it was a different species from *Gaertneri*, which, however, he alludes to when treating of *Makoyanum*, but gives no characters for either differing from *Russellianum*.

According to Regel, who published it in 1884, *E. Gaertneri* was introduced by Messrs. Haage and Schmidt from the province of Minas Geraes, in Brazil. According to Pynaert Mr. Makoy imported it, also from Brazil, in 1888. The specimen here figured was obtained from Messrs. de Smet, of Ghent, and flowered in a stove of the Royal Gardens in April of the present year.—*J. D. H.*

Fig. 1, Bud; 2 and 3, stamen; 4, stigma:—*all enlarged.*

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Tab. 7202.

DRYMOPHLŒUS appendiculata.

Native of the Malayan Archipelago.

Nat. Ord. Palmæ.—Tribe Areceæ.

Genus Drymophlœus, *Zippel* (*Benth. & Hook. f. Gen. Pl.* vol. iii. p. 892.)

Drymophlœus (Endrymophlœus) *appendiculata;* caudice 6–10 pedali, foliis paucis terminalibus 5–6 ped. longis arcuato-patentibus, petiolo 1½ pedali semitereti, rachi trigona fusco-furfuracea, segmentis 14–20 alternis sessilibus 8–10 poll. longis cuneato-trapezoideis inæquilateris apice irregulariter lobatis et erosis subtus concoloribus segmento terminali flabelliformi, spadicibus infra-foliaceis breviter pedunculatis 10–12 poll. longis et latis laxifloris, rachi crassa, ramis simplicibus patentibus, spathis 3–4 remotis lanceolatis 6–7 poll. longis demum fuscis; fl. masc. v. hermaphrod. sepalis orbiculatis, petalis ¼ poll. longis basi connatis lanceolatis crasse coriaceis, staminibus 30–40 petalis æquilongis basi ovarii adnatis, filamentis filiformibus, antheris oblongis, stylo elongato filiformi, stigmate oblongo tridentato; fl. fœm. minimis globosis, sepalis petalisque orbiculatis erosis, ovario oblongo apice rotundato, baccis ½–⅔ poll. longis ovoideo-oblongis ima basi perianthio emarcido parvulo cinctis lævibus pallide rubris, albumine solido æquabili.

D. appendiculata, *Scheff. in Ann. Jard. Bot. Buitenz.* vol. i. p. 52 et 197.

D. olivæformiss, *W. Wats. in Gard. & Forest, July,* 1891, p. 330, f. 57.

Ptychosperma appendiculata, *Blume Rumph.* p. 122, t. 84 and 119; *Miquel. Fl. Ind. Bat.* vol. iii. p. 30; *Griff. Palms of Brit. E. Ind.* t. 142 A (*Ic. Blume iterat.*).

Seaforthia jaculatoria *Mart. Nat. Hist. Palm.* p. 186 et 314.

Areca olivæformis, β gracilis, *Giseke Prael. Ord. Nat.* p. 180.

A. vaginata, *Giseke l. c.*

Triartea ? monogyna, *Zipp. Bijd. Nat. Wet.* vol. v. p. 178.

Saguastri, sp. *Rumph. Herb. Amboin.* vol. i. p. 68.

Drymophlœus is a tropical genus of small palms, consisting of about a dozen species, scattered over the torrid regions of the Old World, from the Malayan Peninsula to the Pacific Islands, inclusive of New Guinea and Northern Australia. None have as yet been found in British India, though two are figured in Griffith's "Palms of the British East Indies" as species of *Ptychosperma* (t. 242 A, B). These are, however, unacknowledged copies of Blume's figures, the one (t. 242 A) of *Pt. appendiculata*, and the other (t. 242 B) of his *Pt. olivæformis*, made no doubt by

Griffith for his own use, and introduced, through inadvertence, into his work by the editor of his works. I am indebted for the older synonymy of *D. appendiculata* to Blume's Rumphia.

D. appendiculata is a native of the Island of Gilolo, one of the Moluccas, and of New Guinea; its nearest ally is *D. oliraeformis*, Scheff., which differs in having narrower leaflets, and the fruit half immersed in the greatly enlarged perianth. The plant here figured was received under the latter name from Dr. Wendland, of the Royal Botanical Gardens of Herrenhausen, Hanover. It flowered for the first time in the Palm House at Kew in June, 1890, when the trunks were three feet high and one and a half inches in diameter, and fruited in the autumn of the same year. The plant probably attains much larger dimensions. As far as is recorded, the *Drymophloei* are not used for any other purpose than for house-building.—*J. D. H.*

Fig. 1, Male (or hermaph.) flower unexpanded; 2, the same expanded; 3, the same cut open vertically; 4, stamens; 5, fem. flower; 6, sepal; 7, ovary; 8, the same cut off vertically:—*all greatly enlarged.*

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Tab. 7203.

PINGUICULA lutea.

Native of the Southern United States.

Nat. Ord. Lentibularieæ.

Genus Pinguicula, *Linn.*; (*Benth. et Hook. f. Gen. Plant.*, vol. ii. p. 988.)

Pinguicula *lutea;* foliis brevibus sessilibus oblongo-ovatis obtusis, scapis calyceque glanduloso-pubescentibus, sepalis lineari-oblongis, corollæ aureæ tubo late infundibulari in calcar decurvum æquilongum v. brevius decurvum subulatum contracto, limbi lobis subæqualibus integris 2-lobis v. inæqualiter 4-lobulatis, palato incrassato genitalibusque glanduloso-pilosis, capsula ovoidea acuta calycem vix superante.

P. lutea, *Walt. Fl. Carolin.* p. 63; *Michaux Fl. Bor. Am.* vol. i. p. 11; *Pursh Fl. Am. Sept.* vol. i. p. 14; *Ker in Bot. Reg.* t. 126; *A. DC. Prodr.* vol. viii. p. 32; *Chapm. Fl. S. U. States*, 284; *A. Gray Synopt. Fl. U. States*, vol. ii. pt. 2, p. 318.

P. edentula, *Hook. Exot. Fl.* t. 16.

P. campanulata, *Lamk. in Journ. Hist. Nat.* 1792, p. 336, t. 18, f. 1.

Brandonia, *Reichb. Conspect.* p. 127.

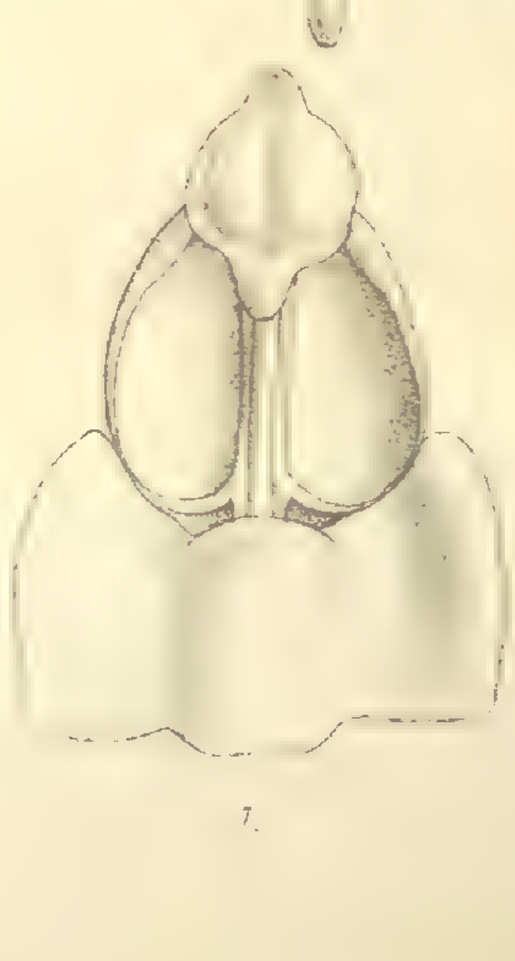
A native of the Southern United States of North America, from North Carolina to Louisiana and Florida, where it is common in low pine barrens. It is an exceedingly variable plant in the size of all its parts, and especially in the obtuse toothing of the lobes of the corolla. A form with the corolla-lobes quite entire has been described by my father as *P. edentula* in the "Exotic Botany," and which is considered by other botanists as a distinct variety; but A. De Candolle, who retains it as a variety, says of *P. lutea* that in some specimens of *lutea* sent by M. Michaux the lobes are all four-toothed, whilst in the figure in the Botanical Register the upper are simply obcordate and the lower four-toothed, and in specimens communicated by A. Gray all are entire; to which should be added that in the Flora Exotica figure, the type of *edentula*, they are all obcordate. In dimensions the corolla varies from half an inch to an inch and a half in diameter.

P. lutea differs from all others of the genus in the nearly regular, not two-lipped, corolla and its yellow colour, upon

which characters the elder Reichenbach founded the genus *Brandonia*. A. Gray, indeed, suggests the possibility of the var. *edentula* being a hybrid with *P. pumila*, Michx., a species with pale violet flowers varying to white, a native of the same localities as *P. lutea*, and in which the corolla limb is more regular than in the common form of that organ in the genus, though still distinctly two-lipped; but besides the colour of the flowers, the base of the corolla of that plant is saccate and the capsule globose.

The late Mr. Nuttall was the first to send *P. lutea* to England, in 1816, where it was flowered by Messrs. Colville in their nurseries, King's Road, Chelsea; their plants, however, did not attain half the size of these here figured, which were obtained by the Royal Gardens from the United States Botanical Garden of Washington. They were received in March, and flowered in the following May of this year, under the same treatment as Sarracenias and Cape Droseras.—*J. D. H.*

Fig. 1, Longitudinal section of the corolla; 2, top of scape, stamens, and ovary:—*all enlarged.*



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Tab. 7204.

ANGRÆCUM FASTUOSUM.

Native of Madagascar.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Angræcum, *Thou.*; (*Benth. & Hook. f. Gen. Pl.* vol. iii. p. 583.)

Angræcum *fastuosum*; acaule, foliis confertis oblongis apice rotundatis v. emarginatis crasse coriaceis supra luride virescentibus rubro marginatis subtus pallidioribus medio costatis, pedunculo foliis breviore crasso cylindraceo obtuso pauciflоro, bracteis caducis, floribus 1½ poll. diam., sepalo dorsali oblongo-lanceolato obtuso, lateralibus paullo majoribus, petalis ovato-lanceolatis sepalis lateralibus æquilongis, labello oblongo apice 2-dentato medio carina lata convexa percurso, calcare filiformi flavido labello plus duplo longiore, columna minuta latiuscula bicamerata, anthera mitriformi, polliniis minutis didymis, caudiculis filiformibus rostello incumbentibus, glandulis tenuiter cylindraceis caudiculis crassioribus et fere duplo longioribus calcare absconditis.

A. fastuosum, *Reichb. f. in Gard. Chron.* 1881, vol. ii. p. 748, 844; 1885, vol. i. p. 533, fig. 96.

A very singular species, quite unlike any other hitherto described, remarkable, according to Reichenbach, for the rugged surface of the leaves and the variable form of sepal and lip. In his first account of the plant, in the Gardener's Chronicle for 1881, vol. ii. p. 748, Reichenbach (from specimens imported by Leon Hublot) describes it as having leaves bilobed and as rugose on the upper surface as the bulb of *Eriopsis rutidobulbon*, slender filiform sepals and petals two to three inches long, and a lip narrower than these, characters which it is impossible to conceive being applicable to any form of the plant here figured. In a subsequent notice, at p. 844 of the same volume, he speaks of a plant of *A. fastuosum* obtained from Sir Trevor Laurence as equal to his type in all details, but having an obovate rounded lip, instead of a narrow acute one, and suggests either that M. Hublot's plant was a pelorioid form, or that there are two species closely alike. There is no modification of his description of the rugose leaves or of the slender filiform petals two to three inches long, and were it not for the figure of the plant, from a specimen in Sir T. Laurence's collection, given by Dr. Masters in the

Gardener's Chronicle for 1885 (vol. i. p. 533, fig. 96) Reichenbach's *fastuosum* must have been relegated to the limbo of indeterminable species. With that figure ours perfectly accords, except in that the leaves of the latter are merely notched at the tip, and the lip is more oblong obtusely toothed at the tip, and with a very broad low median thickened band or ridge from the base to the tip. The rugosity of the leaf occurs only after flowering, and is hardly preceptible in the Kew plant.

The most remarkable character of *A. fastuosum* (though it may be common to other *Angraeca*) is the great length of the glands of the minute didymous pollinia, which are cylindric, almost twice as long as, and much thicker than, the filiform caudicles, and are concealed within the spur, whence no doubt they are abstracted by insects in search of the honey in the spur.

A. fastuosum was received by Messrs Sander and Co., of St. Albans, and flowered in the Royal Gardens in May of this year, and continued to flower till the middle of September.

I am at a loss to account for the specific name of *fastuosum*, the plant being a very modest one, and by no means suggestive of pride or scorn.—*J. D. H.*

Fig. 1, Front view of base of lip and column; 2, side view of top of ovary column and base of lip with top of spur; 3 and 4, front and back view of anther; 5, pollinia :—*all greatly enlarged.*

1
2
3
4

Tab. 7205.

CEREUS procumbens.

Native of Mexico.

Nat. Ord. Cacteæ.—Tribe Echinocacteæ.

Genus Cereus, *Haw.*; (*Benth. et Hook. f. Gen. Plant.*, vol. i. p. 849.)

Cereus (Echinocereus) *procumbens;* humilis, caule subterete v. 4–5-gono ramosissimo articulato glauco-virescente, tuberculis distinctis spiralibus seu 4–5-faris, areolis parvis orbiculatis, aculeis 4–7 radiantibus brevibus rigidis albis apice fuscis, centrali nullo v. longiore, floribus sub apice ramorum lateralibus amplis, ovarii pulvillis sub 25 albido-villosis, aculeolos rigidos 6–9 breves variegatos gerentibus, sepalis tubi exterioribus 12–15 aculeoliferis, superioribus sub 15 lineari-lanceolatis acuminatis, petalis 18–30 roseis patulis lineari-spathulatis acutis v. obtusis erosis v. integris, staminibus densissimis, antheris minutis flavis, stigmatibus 10–14 viridibus, bacca ovoidea, seminibus parvulis lenticularibus basi hilo oblongo truncatis verruculosis.

C. procumbens, *Engelm. in Plant. Fendler*, 50 (1810); *Plant. Lindheim.* pt. ii. (1850) p. 203; *Synops. of Cactæ of U. States, &c.* p. 30; *Cactæ Mex. Bound. Surv.* p. 38, t. 59, f. 1–11; *Trelease & A. Gray, Bot. Works of G. Engelman*, pp. 114, 120, 139, 200, t. 59, fig. 1–11; *Young Fl. Texas*, p. 275.

The beautiful plant here figured, though undoubtedly the *Cereus procumbens*, differs in a few points from the elaborate description of the accomplished monographer of North American cacti, in the larger flowers with more numerous petals, rose (not violet) in colour, in the pale glaucous green colour (not "perviridis"), in the great length of the central spine of the pulvilli, which Engelman describes as either absent or hardly longer than the radiating spines. The only species with which it could be confounded is *C. Berlandieri*, Engelm., a native of the adjoining district of Southern Texas, but that species has very narrow, almost linear, petals.

C. procumbens is a native of the neighbourhood of Matamores in Mexico, a town on the banks of the Rio Grande del Norte, which separates Texas from Mexico, and is about thirty miles from the embouchure of that river. Plants of it were purchased for the Royal Gardens from Mr. J. H. Erkener, of San Antonio in Texas, in 1885, which flowered in May of the present year.

November 1st, 1891.

Mr. Watson informs me that the species of *Echinocereus*, even if grown in full sunshine, very rarely flower under cultivation at Kew, though they grow freely. That here figured was kept dry for nearly half the year.—*J. D. H.*

Fig. 1, Pulvillus and spores; 2, calyx segments; 3, stamen; 4, stigma:—*all enlarged.*

M.S.del, J.N.Fitch lith.

Vincent Brooks Day & Son lith.

Tab. 7206.

DISA tripetaloides.

Native of South Africa.

Nat. Ord. Orchideæ.—Tribe Ophrydeæ.

Genus Disa, *Berg.* ; (*Benth. & Hook. f. Gen. Pl.* vol. iii. p. 630.)

Disa (Eudisa) *tripetaloides;* glaberrima, foliis gramineis v. anguste linearioblongis acuminatis dorso carinatis, scapo elongato stricto erecto vaginato, vaginis appressis acuminatis, spicis laxifloris, bracteis lanceolatis acuminatis ovario basi vaginato brevioribus viridibus, ovario torto, floribus albis roseo suffusis 1 poll. latis, sepalo dorsali galeato subhemispherico in calcar breviore rectum constricto intus sanguineo-maculato, sepalis lateralibus alæformibus rotundato-obovatis obscure maculatis, petalis carnosis galea inclusis lineari-oblongis apicibus incurvis rubro fasciatis, labello minuto lineari, columna incurva antice concava basi bigibba, rostello breviter bifido, anthera reflexa apice unguiculata, polliniis pyriformibus bilobis, caudicula breve, glandula minuta.

D. tripetaloides, *N. E. Brown in Gard. Chron.* 1889, vol. i. p. 360; *Masters l. c.* 1890, vol. i. p. 766, fig. 127.

Orchis tripetaloides, *Linn. Suppl.* p. 198; *Syst. Veg. Ed.* xiv. p. 807.

D. excelsa, *Thunb. Fl. Cap.* 14 *in part.*

D. venosa, *Lindl. Gen. & Sp. Orchid.* 357, *non Swartz.*

Mr. Brown, in his description of this plant, says that though an old one it is now published for the first time under a new name. It is the *Orchis tripetaloides* of the younger Linnæus, discovered by Thunberg at the Cape of Good Hope a century ago, but was confused by its discoverer in his Herbarium and Flora with his *Disa excelsa*, which again is compounded of the leaves of *D. tripetaloides* and the stem and flowers of another plant. Lindley, in his Genera and Species of Orchideæ, has wrongly referred the *D. tripetaloides*, Lindl., to *Disa venosa* of Swartz, a very different plant, which has again been confused with *D. racemosa*.

The above is the result of Mr. N. E. Brown's examination of the Herbarium of Thunberg, which was generously lent to the Royal Gardens of Kew by the University of Upsala (through the instrumentality of Professor Theod. Fries) for the purpose of identifying the Orchids; and the results of which will, it is hoped, soon be published.

November 1st, 1891.

Mr. Watson informs me that the *D. tripetaloides* and *D. racemosa* are very easily cultivated at Kew, where *D. grandiflora* is almost a failure; as also that Messrs. Veitch have raised seedlings from crossing it with *D. grandiflora*, as they also have from crossing *D. racemosa* with *grandiflora*, the latter cross being named *D. Veitchii*.

There remains only to add that *D. tripetaloides* is a native of the Southern and Eastern districts of the Cape Colony, from a little East of Table Bay to the Southern districts of the Natal Colony, growing with *D. venosa* on marshy ground. It was introduced into cultivation by Mr. James O'Brien, of Harrow-on-the-Hill; it is a fleshy-rooted plant of as easy cultivation and propagation by stoves as a Primrose. The specimens figured flowered in a cool house in the Royal Gardens. The plant is very hardy, having been frozen hard in a cold frame without injury. Its flowering season lasts for three months.—*J. D. H.*

Fig. 1, Top of ovary, lip, and column, with the anther removed; 2, petal; 3, column with anther; 4, pollinium:—*all enlarged.*

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Tab. 7207.

AGAVE albicans.

Native of Mexico.

Nat. Ord. Amaryllideæ. Tribe Agaveæ.

Genus Agave, *Linn.* (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 738.)

Agave (Littæa) *albicans*; acaulis, foliis 20–30 dense rosulatis oblanceolato-spathulatis carnoso-coriaceis persistenter glaucescentibus, spinâ terminali haud pungente, aculeis marginalibus crebris minutis deltoideis, pedunculo stricto foliis 3–4-plo longiore foliis reductis pluribus scariosis adpressis prædito, floribus in spicam densam oblongam congestis, bracteis magnis lanceolatis acuminatis, perianthii segmentis oblongis intus brunneis tubum duplo superantibus, staminibus segmentis 3–4-plo longioribus.

A. albicans, *Jacobi Vers. Syst. Ord. Agav.* p. 137; *Baker in Gard. Chron.* 1887, vol. ii. p. 717, fig. 138; *Handb. Amaryll.* p. 191.

A. Ousselghemiana, *Jacobi Nachtrag.* p. 156.

A. micracantha, *var.* albidior, *Salm-dyck in Bonplandia*, vol. vii. p. 87.

Of these comparatively soft-leaved tender Agaves, which compose the group called "*Aloidæ*," only two species, viz. *A. Celsiana*, tab. 4934, and *A. Sartorii*, tab. 6292, have yet been figured in the "Botanical Magazine." My estimate of the total number of species at present known is thirty, but many of these have been described from very imperfect material and are not known in flower. The present plant is closely allied to *A. micracantha* Salm-dyck (figured in the "Refugium Botanicum" of Saunders, tab. 327), and scarcely more than a variety of that species in a broad sense. It was introduced into cultivation about 1860, and if, as I believe, *A. Ousselghemiana*, of the Belgian gardens, is identical with it, was first flowered by Count Kerchove d'Ousselghem in 1867. In England it was flowered by Mr. Justus Corderoy, at Blewbury, in 1887. Our drawing was made from a plant that flowered in the Succulent House at Kew, in May, 1891, and was purchased in 1889 at the sale of the late Mr. J. T. Peacock's collection of Succulent plants.

Descr. Acaulescent. *Leaves* twenty to thirty in a dense rosette, oblanceolate-spathulate, twelve or fifteen inches long, three or four inches broad at the middle, narrowed to two or two and a half inches above the dilated base, com-

paratively soft and pliable in texture, persistently glaucous on both surfaces, tipped with a soft brownish spine an inch long, closely margined with minute unequal deltoid brownish prickles. *Peduncle* stiffly erect, three or four times as long as the leaves, furnished with copious erect lanceolate-acuminate scariose bract-leaves. *Spike* oblong, one and a half or two feet long, half a foot in diameter when fully expanded; flowers in pairs, subtended by a large lanceolate-acuminate scariose bract. *Perianth*, including the ovary, an inch and a half long, green outside; segments oblong, brown inside, above half an inch long, twice as long as the funnel-shaped tube. *Stamens* three or four times as long as the perianth-segments. *Style* developed after the stamens, finally reaching up to the anthers.—*J. G. Baker*.

Fig. 1, Margin of leaf; 2, a flower cut open; 3, horizontal section of ovary:—*all enlarged*.

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Tab. 7208.

BULBOPHYLLUM macranthum.

Native of Burma and the Malayan Archipelago.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Bulbophyllum, *Thou.*; (*Benth. & Hook. f. Gen. Pl.* vol. iii. p. 501.)

Bulbophyllum *macranthum*; rhizomate robusto elongato, pseudobulbis sparsis ovoideis teretibus vestigiis scopæformibus vaginarum cinctis, foliis breviter petiolatis lineari-oblongis bidentatis crasse coriaceis, pedunculis 1-floris basi vaginatis nudis, floribus amplis reversis purpureo maculatis, perianthio patente, sepalis subæqualibus, dorsali ovato-lanceolato, lateralibus conniventibus dimidiato-ovatis obtuse acuminatis, petalis sepalo dorsali conformibus sed paullo minoribus, labello breviter stipitato unguiculato recurvo basi truncato sub-biauriculato, columna brevi apice utrinque dilatete.

B. macranthum, *Lindl. in Bot. Reg.* 1844, f. 13; *Walp. Ann. Bot.* vol. vi. f. 245; *Ridley in Ann. Bot.* iv. (1890) p. 335, t. xxii. fig. 1–6; *Hook. f. Fl. Brit. Ind.* vol. v. p. 753.

Sarcopodium macranthum, *Lindl.* in *Paxt. Fl. Gard.* vol. i. p. 155, *cum Ic.*; *Fol. Orchid., Sarcopod.* p. 3.

This is one of the single-flowered species of *Bulbophyllum* with large usually spreading petals, to which Lindley gave the same *Sarcopodium*, and in which the peduncle of flower is really an elongated pedicel, starting from the rhizome at the base of the pseudobulb, the true peduncle being suppressed. Lindley's figure of it in the Botanical Register represents the lateral sepals as of the same uniform dull blue-purple colour as the dorsal and petals; the fact is that the flowers change colour after expansion, being first of a vinous red but the dorsal sepal and petals becoming dull blue-purple with broad spots of a dark blue, and the lateral sepals yellowish speckled with bright red on the outer half. Lindley figures the foot of the column as not produced beyond the insertion of the lateral sepals, and so I have described it in the Flora of British India, but in the specimen here figured it is produced into a distinct stipes to the lip.

The fertilization of *B. macranthum* is the subject of a very interesting paper by Mr. H. N. Ridley, M.A., F.L.S., Superintendent of the Botanical Gardens, Singapore, published in the Annals of Botany cited above, and which

is effected by a small dipterous insect. The following is the substance of his elaborate description of the operation :—

"The insect usually commences by licking the upper part of the sepals, and eventually settles down on the front of the lateral sepals, and commences to lick them. As long as it is at work on the narrow upper part of the sepals, it can hold on to their edges, but when it gets to the broad part it cannot reach across. Its feet then slip from the glassy surface, and it clutches wildly at the lip. Immediately its weight falls upon the lip, the latter suddenly drops back, pitching the insect stern first into the column, between its arms, which have enough springyness in them to separate a little, and then close tightly on the body of the captive. The insect strikes the gland of the pollinia with the upper part of its abdomen, and the pollinia become fixed with exact precision upon the first segment of that organ ; the lower part of the abdomen generally adhering to the stigma. The lip, released by the fly, instantly returns to its original position, and the insect is left struggling on its back in the arms of the column. Soon, however, it releases itself, and flies away with the pollen on its back, and, repeating the process on another flower, places the pollen on its stigma. For further interesting details I must refer to Mr. Ridley's paper and its illustrations of the process.

B. macranthum would appear to have a very wide range. There are specimens in the Kew Herbarium collected by the Rev. Mr. Parish in Tenasserim at an elevation of three thousand six hundred and thirty-six feet. That figured by Lindley (and Mr. Ridley's) are from Singapore. The specimen here figured, and which was received from Mr. F. Kramer, gardener at Flotbeck Park, near Hamburg, in 1888, was said to have been imported from Java. It flowered in the Royal Garden in May, 1890.—*J. D. H.*

Fig. 1, Top of ovary, column and lip; 2 and 3, view of lip; 4, column; 5, anther; 6, pollinia :—*all enlarged.*

M.S. del, J.N. Fitch lith.

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Tab. 7209.

TROCHETIA Blackburniana.

Native of the Mauritius.

Nat. Ord. Sterculiaceæ.—Tribe Dombeyeæ.

Genus Trochetia, *DC.*; (*Benth. et Hook. f. Gen. Plant.*, vol. i. p. 222.)

Trochetia *Blackburniana;* frutex v. arbuscula, ramulis petiolis costis foliorum pedunculisque pilis stellatis ferrugineo-furfuraceis, foliis longe petiolatis elliptico- v. obovato-oblongis acutis integerrimis v. crenato-serratis a basi 7-costatis, basi subcordatis, supra læte viridibus sparse lepidotis subtus pallidis, pedunculis supra-axillaribus unifloris 2-bracteolatis petiolo longioribus decurvis, floribus amplis campanulatis, sepalis elongatis lanceolatis dorso puberulis, petalis convolutis oblique obovato-rotundatis infra medium albis roseo venosis apicibus sanguineis, antheris 30 linearibus in apicem columnæ staminea plicatæ subsessilibus, ovario stellatim tomentello, stigmatibus brevissimis.

T. Blackburniana, *Bojer Hort. Maurit.* 41 (*name only*); *Baker, Fl. Maurit.* 29.

Trochetia is one of the most interesting genera of plants, on account of its unique distribution; the few species which it contains being, with the exception of one found in Madagascar, confined to the two oceanic Islands of St. Helena in the Atlantic Ocean and the Mauritius in the Indian. The species are thus separated by nearly two thousand miles of ocean as well as by the interposed continent of Africa, which covers as many miles of latitude. There are four Mauritian species, of which one alone has flowered and been figured in this country, the *T. triflora*, DC. (*T. grandiflora*, Lindl. Bot. Reg. 1844, t. 21), with white corymbose flowers larger than those of *T. Blackburniana*, and twenty anthers; it blossomed at Syon House in 1844, and is no doubt long lost. As far as is known the Mauritian species are all still to be found in more or less abundance in the virgin forests of the higher parts of that island. It is very different in the case of the two St. Helena species, *T. melanoxylon*, Benth. (*Pentapetes Erythroxylon*, Tab. 1000 of this work), and *T. Erythroxylon*, Benth. (*Melhania Erythroxylon*).

Of these the first has been extinct for many years in the

Island, and was last known in a living state only as cultivated in the Palm House at Kew, and Mr. Melliss, in his excellent work "A Physical, Historical and Descriptive Account of St. Helena," published in 1875, says of it, that weather-beaten stems of it were then still to be found deeply imbedded in the surface soil over a considerable portion of the Island. Of *T. Erythroxylon* the same author states that there were at that time still two or three plants of it growing amongst the Cabbage trees of Diana's Peak and High Peak, but that the individuals were quickly disappearing, adding that a few (perhaps seventeen or eighteen in all) were still cultivated in the Island. I have since heard that but one native tree of it alone remains. As is well known, the destruction of the forest that once clothed the Island of St. Helena is due to indiscriminate felling for firewood, and the introduction of goats.

T. Blackburniana was sent for figuring in this work by Mr. F. W. Burbidge, M.A., Curator of the Trinity College Botanical Gardens, Dublin, where it flowered in May of this year.—*J. D. H.*

Fig. 1, Stellate hairs of the stem and leaves; 2, bud with peduncle and bracts, from a sketch by Mr. Burbidge; 3, petal; 4, staminal column; 5, group of 3 anthers; 6, portion of the staminal column showing the staminodes; 7, ovary; 8, transverse section of do.; 9, stellate hairs from do.:—*all but fig. 2 enlarged.*

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Tab. 7210.

VERONICA Lavaudiana.

Native of New Zealand.

Nat. Ord. Scrophularineæ. Tribe Digitaleæ.

Genus Veronica, *Linn.*; (*Benth. et Hook. f. Gen. Plant.*, vol. ii. p. 964.)

Veronica (Hebe) *Laraudiana;* fruticulus ramosus foliosus, ramulis crassiusculis foliisque glaberrimis, foliis parvis patulis spathulato- v. obovato-rotundatis coriaceis breviter crasse petiolatis crenatis viridibus marginibus sanguineis, floribus albis in corymbos terminales amplos densifloros crasse pedunculatos dispositis sessilibus, bracteis ovatis obtusis sepalisque æquilongis glanduloso-pilosis tubo corollæ paullo brevioribus, corollæ lobis tubo subæquilongis patenti-recurvis, postico majore orbiculato, lateralibus oblongis obtusis, antico ovato obtuso, filamentis brevibus, antheris majusculis vix exsertis, ovario obcordato glaberrimo, stylo gracili longe exserto, stigmate capitellato, capsula minuta oblongo-ovoidea obtusa calycem subæquante.

V. Lavaudiana, *Raoul Choix des Plantes de la Nouv. Zel.* p. 16, t. 10; *Hook. f. Fl. New Zealand*, vol. i. p. 195; *Handbook of the New Zealand Flora*, p. 214; *Gard. Chron.* 1891, i. 934, f. 154.

The numerous New Zealand Veronicas are being rapidly introduced into this country, chiefly through the agency of Mr. Armstrong, of the Botanical Gardens, Christ Church, Canterbury, and are destined to hold a prominent position in the Rock Gardens of amateurs. As is well known, the genus is the prominent botanical feature of the undershrubbery of the New Zealand Archipelago, from the Northern Cape to the Antarctic Islands; and it is a very singular fact that the most arboreous member of the whole genus, *V. elliptica*, Forst. (*V. decussata* Ait. Tab. 242), which attains twenty feet in height, is the most southern of all, extending from Otago to Campbell's Island, in Lat. $52\frac{1}{2}$ south, and in Tierra del Fuego to nearly 56° south.

In the "Handbook of the New Zealand Flora," published (the first part) in 1864, I described forty species, all peculiar to the group except the aforesaid *V. elliptica*, and the common British *V. Anagallis*, which inhabits many parts of the world. That number has been brought up to sixty by Mr. J. B. Armstrong, who has published a tabular resumé of the species in the Transactions of the New Zea-

land Institute. In a very interesting account of the genus as found in New Zealand, which prefaces his tables, Mr. Armstrong states that except *Coprosma* no other enters so largely into the composition of the Floral scenery; that all the species are worthy of cultivation, and that this genus alone would be sufficient to give interest and variety to the botany of the country. He goes on to state that no other genus presents such extreme variability; but that he does not attribute this to hybridization, for that after an examination of between four thousand and five thousand specimens, and a careful experimentation in the largest existing collection of cultivated species, that in the Christ Church Botanical Gardens, he is convinced that self-fertilization is the rule in the genus, and that the theory of hybrids is untenable. The seedlings, he says, invariably resemble their parent, but sports occur which reproduce their own characters, and that this process has given rise to the greater number of the known New Zealand forms. He further adds that the cultivated plants in New Zealand (presumably European) are all liable to sport, and that the introduced weeds are nearly all self-fertilized.

V. Lavaudiana was discovered in 1840 at Akaroa, by M. Raoul, Surgeon on board the French corvette, *L'Aube*, and is beautifully figured in his "Choix des Plantes de la Nouv. Zealand." It is also a native of the Canterbury plains, where it was collected by Dr. Lyall, F.L.S., Surgeon and Naturalist of H.M.S. *Acheron*, when surveying the islands, and by subsequent botanists. It was introduced into this country previous to 1880 by the late Isaac Anderson Henry, Esq., of Trinity, Edinburgh, who sent me a small flowering branch of it in that year, and the specimen here figured was kindly forwarded for figuring by Mr. Burbidge, M.A., F.L.S., Curator of the College Botanical Gardens, Dublin, in May of last year.—*J. D. H.*

Fig. 1, Flower; 2, calyx and bracts; 3, corolla and stamens; 4 and 5, stamens; 6, pistil:—*all enlarged.*

M S d. J N F. lith.

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Tab. 7211.

ARISÆMA anomalum.

Native of the Malay Peninsula

Nat. Ord. Aroideæ.—Tribe Arineæ.

Genus Arisæma, *Mart.*; (*Benth. & Hook. f. Gen. Pl.* vol. iii. p. 965.)

Arisæma *anomalum;* rhizomate deformi plurifoliato et plurifloro, foliis scapisque remotis, vaginis elongatis, petiolo gracili 3- rarius 5-foliato, foliolis subsessilibus conformibus ovatis tenuiter acuminatis nervosis, scapo petiolo æquilongo v. longiore pallido brunneo striato, spathæ tubo cylindraceo pallido fusco-purpureo fasciato, limbo brevi dilatato galeato-fornicato incurvo acuminato acumine ascendente, oris marginibus latiuscule evertis et recurvis, spadicibus masculis v. androgynis, organibus neutris supra mascula v. cum iis immixtis subulatis, fl. masc. parvis stipitatis tetrathecis, ovariis dense congestis globosis, stigmate sessili penicillato, ovulis numerosis, appendice parte florifera spadicis æquilonga sessili subulata inclusa.

A. anomalum, *Hemsl.* in *Journ. Bot.* 1887, p. 205; *N. E. Br. in Gard. Chron.* 1890, vol. i. p. 321.

In mode of growth this *Arisæma*, as Mr. Brown pointed out in the Gardener's Chronicle, differs from all others hitherto described, for instead of having a solitary annual tuber, it presents an elongated stout subterranean root-stock, which bears tubers (or tuberous branches) of irregular shape that give origin some to a leaf, others to a flowering scape. And as the rootstock continues to grow for a long period (at least under cultivation) and the leaves are of longer duration than the flowers, the whole plant presents the remarkable phenomenon of being always in leaf, and often in flower also. Further information regarding the periodicity of leafing and flowering would be very interesting, and especially as to whether the development of leaf and flower are cotemporaneous, and if not in what order they appear. As far as it is at present known the rhizome bears leaves and flowers alternately, though in some cases both may proceed from one branch or tuber of the rhizome. M. Hemsley suggests that *Arisæma Wrayi* (Tab. 7105), may have the same root structure. Mr. Brown, who has made a careful study of the living plant,

describes the lateral leaflets as sometimes bipartite, showing a tendency in the leaf to become digitate. Another anomalous feature in *A. anomalum* is the stigma, which is not capitate as usual in the genus, but composed of a pencil of spreading hairs.

A. anomalum was discovered by Mr. Curtis, of the Botanical Garden, Penang, in the Laret Islands, in the Straits of Malacca, from whom tubers were received in 1888 which flowered in the Royal Gardens in March, 1890. —*J. D. H.*

Fig. 1, Male spadix; 2, male flower; 3, androgynous spadix; 4, ovary; 5, the same cut open vertically; 6, ovule:—*all enlarged.*

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